



TIME CRITICAL REMOVAL PLAN

FOR THE

TOLEDO TIE TREATMENT SITE

LOCATED AT

ARCO INDUSTRIAL PARK TOLEDO, OHIO

AUGUST 1998

Prepared For:

**KERR-McGEE CHEMICAL, LLC
KERR-McGEE CENTER
OKLAHOMA CITY, OKLAHOMA 73125**

Prepared By:



**HULL & ASSOCIATES, INC.
3401 GLENDALE AVENUE
SUITE 300
TOLEDO, OHIO 43614**

**TIME CRITICAL REMOVAL PLAN
TOLEDO TIE TREATMENT SITE**

TABLE OF CONTENTS

	Page
1.0 INTRODUCTION	1
<u>1.1 Report Organization</u>	<u>1</u>
<u>1.2 Site Description</u>	<u>2</u>
<u>1.3 Status of Ongoing Removal Actions</u>	<u>4</u>
2.0 SUMMARY OF INITIAL FIELD INVESTIGATIONS.....	6
<u>2.1 Collection of Surface Water Samples.....</u>	<u>7</u>
<u>2.2 Installation of CPT/LIF Borings</u>	<u>7</u>
<u>2.3 Installation of Geoprobe Borings and Test Pits</u>	<u>10</u>
<u>2.4 Collection of Sediment Samples.....</u>	<u>12</u>
<u>2.5 Collection of Ambient Air Samples.....</u>	<u>13</u>
3.0 RATIONALE FOR TECHNICAL APPROACH	16
4.0 IMPLEMENTATION OF THE REMEDY	18
<u>4.1 Lagoon Excavation and Infrastructure Removal</u>	<u>18</u>
4.1.1 Excavation, Backfill and Site Grading	19
4.1.2 Utility Removal and Replacement	20
4.1.3 Road Removal and Replacement.....	21
<u>4.2 Sediment Removal</u>	<u>22</u>
4.2.1 Sediment Excavation and Backfill	22
4.2.2 Williams Ditch Rerouting	23
<u>4.3 Subsurface Barrier (French Drain)</u>	<u>23</u>
4.3.1 Excavation.....	24
4.3.2 Construction.....	24
4.3.3 Operation	24
<u>4.4 Required Contractor Submittals</u>	<u>25</u>

**TIME CRITICAL REMOVAL PLAN
TOLEDO TIE TREATMENT SITE**

TABLE OF CONTENTS (cont.)

	Page
4.4.1 Site Specific Health and Safety Plan (HASP)	25
4.4.2 Stormwater Management Plan	26
4.4.3 Dust/Odor Control Plan	26
4.4.4 Air Monitoring/Sampling Plan	26
4.4.5 Dewatering/Stabilization Plan	26
4.4.6 Contingency Plan	27
4.4.7 Traffic Plan	27
4.4.8 Project Schedule and Management Plan	27
5.0 REFERENCES	28

LIST OF TABLES

Table 1	Surface Water Sampling Notes
Table 2	Summary of Surface Analytical Results - Surface Water Samples
Table 3	Soil Sampling Notes
Table 4	Summary of Analytical Results - Soil Samples
Table 5	Test Pit Excavation Notes
Table 6	Sediment Sampling Notes
Table 7	Summary of Analytical Results - Sediment
Table 8	Summary of Analytical Results -Air

LIST OF FIGURES

Figure 1	Site Location Map
Figure 2	Soil Sampling Locations
Figure 3	Sediment and Surface Water Sampling Locations
Figure 4	Test Pit Locations
Figure 5	Background Air Sampling Locations
Figure 6	May Worst Case Air Sampling Locations
Figure 7	August Worst Case Air Sampling Locations- August 1998
Figure 8	Proposed Removal Schedule

LIST OF APPENDICES

Appendix A	Overall Site Map
Appendix B	ROST™ Logs and LIF Signature Thickness map
Appendix C	Geoprobe and Test Pit Logs
Appendix D	Geologic Cross-Sections

**TIME CRITICAL REMOVAL PLAN
TOLEDO TIE TREATMENT SITE**

TABLE OF CONTENTS (cont.)

LIST OF APPENDICES (cont.)

Appendix E	Geotechnical Data
Appendix F	City of Toledo Comprehensive Ditch Plan
Appendix G	City of Toledo POTW Discharge Standards

LIST OF PLATES

Plate 1	Overall Site Map
Plate 2	LIF Signature Thickness Map
Plate 3	Cross Section A-A'
Plate 4	Cross Sections B-B' and D-D'
Plate 5	Cross Section C-C'

1.0 INTRODUCTION

Kerr-McGee Chemical Corporation, now known as Kerr-McGee Chemical, LLC (KMC), was issued a Unilateral Administrative Order (UAO), on December 24, 1997, pursuant to Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The UAO pertains to the Toledo Tie Treatment Site (Site) located in and near the Arco Industrial Park in Toledo, Ohio. Section V, Item 3.5) and Item 3.7) of the UAO dictate that KMC:

Remove the immediate source areas of hazardous substances or implement engineering controls to prevent the contamination in the source areas from migrating to Williams Ditch and to the surface of Frenchmens Road, and

Remove coal tar creosote contamination from Williams Ditch sediments and/or implement additional engineering controls to prevent continued release of contaminants to Williams Ditch.

KMC has entered into a contract with IT Corporation (ITC) formerly known as OHM Corporation (OHM), to complete these time critical activities at the Site. Pending the approval of a work plan, the final scope of work with the contractor will be negotiated. This work plan has been prepared by Hull & Associates, Inc. (HAI) on behalf of KMC to describe KMC's proposed approach to comply with the UAO.

1.1 Report Organization

This work plan is organized into four sections. Section 1.0 presents an overview of the project history and the status of removal activities at the site. Section 2.0 includes a summary of the field investigations conducted at the Site in accordance with the approved Removal Action Work Plan (HAI, April 1998). Section 3.0 provides the rationale for the selected remedy. Section 4.0 addresses the implementation of the remedy and provides a framework for the project as discussed with IT Corporation.

1.2 Site Description

The Site encompasses an area over 50 acres in size and is located in the City of Toledo, Lucas County, Ohio, as shown on Figure 1. The Site was a railroad tie treating facility owned and operated by Federal Creosoting Company (FCC) from approximately 1923 to 1959, and the American Creosoting Corporation (ACC) from 1959 to 1962. Operations ceased in 1962 when the Site was sold to the City of Toledo. In 1969, the Site was sold to Arco Realty, Inc., who subdivided the Site into a number of parcels and developed the area into a business and industrial park.

While operated by FCC and ACC, wooden railroad ties were treated with coal tar creosote at the Site. A site map of the general wood treating operations is included as Plate 1 in Appendix A. Based on a review of aerial photographs from years 1950, 1957, 1963 and 1969, it appears that untreated lumber was stored on the eastern section of the Site, and treated wood was stored on the western section of the Site. An above ground tank farm was located in the central southern section of the Site, south of the old access road formerly known as Creosote Road. The Ohio Environmental Protection Agency (OEPA) reported in the Site Inspection report (SI, 1993) that the tank farm consisted of two 500,000 gallon, three 30,000 gallon, and four 150,000 gallon creosote tanks, and one 150,000 gallon zinc chloride tank. Suspected waste lagoons are located in the central section of the Site, north of the old access road. The suspected lagoons are located east of Arco Drive. One is directly under and two are south of the current location of Frenchmens Road. Based on a review of aerial photographs, it appears that the suspected lagoons were filled between 1969 and 1972. A currently unoccupied distribution warehouse is currently situated over an area which the US EPA's Environmental Sciences Division reports as an irregular shaped depression. (US EPA, Aerial Photographic Analysis, Toledo Tie Treatment Site, May 1998). This area has however historically been referred to as a lagoon. This irregular shaped depression is reported by the US EPA as collecting probable overflow from the adjacent impoundment. Further investigation into the presence and distribution of potential residual contaminants beneath and adjacent to the former distribution warehouse will be conducted during the Engineering Evaluation/Cost Analysis (EE/CA) phase of the project. The investigation approach will be described in a revised Support Sampling Plan (SSP)

Williams Ditch serves as the natural drainage in the area. When the Site operated as a wood treating facility, the ditch ran southwest to northeast along the western section of the Site. The ditch generally intersected what are now known as Arco Drive and Frenchmens Road, at approximately a 45-degree angle. A review of aerial photos indicates the impacted portion of the ditch was rerouted to its current location during the redevelopment of the area.

The Site (see Figure 1) is located on a relatively level piece of property approximately 4,500 feet north of Swan Creek and 8,000 feet south of the Ottawa River. The Site gently slopes toward Williams Ditch, which crosses the Site from southwest to northeast. Elevations across the site range from 620 to 625 mean sea level (msl). Elevations are referenced to the Lucas County Datum.

The Site lies within the Eastern Lake Plains of the Central Lowland physiographic province of North America. This glaciolacustrine landscape typically possesses low relief and low elevation. This flat surface was created due to several widely spaced periods of continental glaciation that supplied the largely unsorted, unstratified surficial drift deposits that cover the land in this area of the state. During the most recent stages of ice retreat, released water became trapped between the retreating ice mass to the north and the glacial deposits to the south and proglacial lakes formed. These lakes produced a thin veneer of lacustrine deposits over the glacial tills.

More specifically, the surficial lacustrine deposits consist of two distinct types: silt and clay deposits representing quiet water deposition; and sand deposits representing higher energy environments (i.e. near shore). The lacustrine deposits are approximately 12 to 14 feet thick at the Site and range from silt to clay to sand.

The Ohio Department of Natural Resource (ODNR), Division of Geological Survey, Drift Thickness Map of Lucas County, Ohio (ODNR, 1985) indicates that the Site sits on the southern slope of a buried valley where the drift thickness is approximately 125 feet. The buried valley trace is from the southwest to the northeast and reaches a maximum depth of approximately 150 feet north of the Site. The glacial drift overlies Devonian limestone or dolomite bedrock.

The ODNR Ground-Water Resources Map of Lucas County indicates that the principal aquifer beneath the Site is a thin, discontinuous sand and gravel lenses interbedded in the clay till filling the preglacial valley. Yields of approximately 10 to 20 gallons per minute (gpm) are encountered at depths of 120 feet or less.

Higher yields may be obtained from the underlying carbonate aquifer. The area in the vicinity of the Site is served by a municipal water supply system, and local use of ground water for potable consumption is expected to be minimal or non-existent. A detailed review of available well record data, City of Toledo water account information, and the municipal water supply system pertinent to the Site will be conducted during the Engineering Evaluation/Cost Analysis (EE/CA) phase of the project.

1.3 Status of Site Removal Activities

A number of environmental investigations were conducted at the Site from 1987 to 1995. Key documents describing site conditions include the "Initial Investigation and Preliminary Risk Assessment" report dated June 27, 1990, by Midwest Environmental Consultants, "The Hydrogeology and Creosote Contamination of an Abandoned Wood Preserving Plant Site at Toledo, Ohio," report dated December 1995, by Greg Victor Lesniak of the University of Toledo, and the 1993 Ohio EPA Site Inspection Report (SI). Results of soil, groundwater, and surface water samples collected from the Site during these investigations indicated contamination from creosote compounds existed near the suspected lagoons, former process area, and Williams Ditch. Some of the major individual polynuclear hydrocarbons (PAHs) detected were naphthalene, benzo(a)pyrene, phenanthrene, chrysene, fluoranthene, acenaphthalene, pyrene, and dibenzo(a,h)anthracene. The SI in the Administrative Record reports that concentrations were detected in the range of 100s to 1,000s of parts per million (ppm) in the soil, sediment, and surface water. Investigations conducted by Ohio EPA in 1993, and the Ohio Department of Health in 1995, determined that sediments in some areas of Williams Ditch were saturated with creosote.

The Administrative Record for the Toledo Tie Treatment Site reports that on September 25, 1997, following a significant rain event in Toledo, Ohio, the National Response Center was notified of the presence of a sheen of an unknown oil in Williams Ditch. On October 1, 1997, representatives of

the U.S. EPA Emergency Response Branch evaluated conditions in Williams Ditch and observed an oil sheen upgradient of the National Super Service storm sewer outfall to Williams Ditch. U.S. EPA documented that the sheen was heavy in the ditch east of Arco Drive (50 to 100 feet) and north (50 to 100 feet) of the location of the suspected creosote lagoon areas. This area of heavy sheening is where a storm sewer apparently runs through the suspected lagoon area to Williams Ditch.

At the request of the U.S. EPA, KMC initiated abatement activities to preclude sheen migration in Williams Ditch on October 10, 1997, and continued these efforts until the issuance of the UAO. Pursuant to the terms of the UAO, KMC prepared work plans for conducting field investigations for the time critical phase and for the Engineering Evaluation/Cost Analysis (EE/CA). A site specific Health & Safety Plan (HASP) was also prepared, which addressed anticipated removal activities. Field investigations to collect data on surface water, soil, sediment, and air at the site were conducted between April 27, 1998 and June 1, 1998, in accordance with the Removal Action Work Plan (HAI, April 1998, approved by the U.S. EPA on April 29, 1998). A second air sampling event, outside the original work plan, was conducted on August 13, 1998. These investigations are briefly described in Section 2.0.

Currently, creosote related contamination that accumulates on the surface of water in Williams Ditch is recovered on a weekly basis. Two siphon dams were constructed and are functioning as intended to control the downstream migration of visible oil and oil sheen in Williams Ditch. The site has been secured with high-visibility fencing and warning signs. Support facilities and equipment, including a site trailer and a dedicated tractor to maintain the grass, have been mobilized. Site visits are conducted on a regular basis to document the site's security status and to conduct perimeter ambient air monitoring.

2.0 SUMMARY OF INITIAL FIELD INVESTIGATIONS

HAI completed the initial field investigation of the project area from April to June 1998 in accordance with the procedures outlined in Appendix A, Field Sampling and Analysis Plan (FSAP) (HAI April, 1998). A worst case air sample was collected in August 1998. The objective of the initial field investigation was to determine the distribution of creosote related contamination in the suspected former lagoon area and to identify the immediate source of creosote related contamination migrating to Williams Ditch. Activities completed during the initial field investigation included:

1. Installation of sixty-five borings in the project area by Fugro Geosciences (Fugro) under the observation of an HAI representative. Borings CPT-1 through CPT-64 and BG-1 were installed using a cone penetrometer testing (CPT) probe and a laser-induced fluorescence (LIF) probe (see Plate 2 for CPT locations).
2. Installation of ten geoprobe borings (SB-1 through SB-10) and six test pits (TP-1 through TP-6) to allow for visual characterization of subsurface conditions in the project area, as well as to facilitate the collection of selected soil samples for chemical and geotechnical analysis (see Figure 2 for soil sampling locations and Figure 4 for test pit locations).
3. Collection of five surface water samples (SW1 through SW4 and BG1) and fourteen sediment samples (SED-001 through SED-013 and SED-BG) to evaluate the quality of water and sediment within Williams Ditch, respectively (see Figure 3 for sediment and surface water sampling locations).
4. Collection of nine ambient air samples to establish a general baseline of ambient air quality at the site and two "worst case" samples to define the pollutants which may impact ambient air during excavation and material handling activities during the removal action (see Figures 5, 6 and 7 for air sampling locations).

A map, showing the overall site, with environmental sampling locations, is provided as Plate 1 in Appendix A. A summary of each task is listed below, including a review of data collected:

2.1 Collection of Surface Water Samples

Five surface water samples were collected from Williams Ditch (BG1 and SW1 through SW4) by HAI representatives on May 12, 1998. Each of the surface water samples were collected as close as practical to the proposed locations presented in the FSAP, the locations of which are shown on Figure 3. Each sample was collected consistent with the procedures presented in the FSAP and submitted to Lancaster Laboratories, Inc. for chemical analysis. Environmental Standards, Inc. is performing data validation. Provided on Table 1 is a summary of surface water sample collection activities, including time of collection, field parameters, and general notes associated with sample collection. Results of the chemical analysis of surface water samples are provided on Table 2.

A review of the chemical data indicates the highest parameter concentrations for surface water samples to be reported for surface water sample SW-2. As shown on Figure 3, surface water sample SW-2 was collected in close proximity to the former lagoon areas, and as discussed in Section 2.2, is located within the approximate extent of impacted shallow soils that have been determined to be potentially affecting the quality of surface water and/or sediment in Williams Ditch using the CPT/LIF data. Parameter concentrations reported for surface water samples collected both upstream and downstream of SW-2 were less than those reported for surface water sample SW-2.

2.2 Installation of CPT/LIF Borings

Sixty-five borings were installed by Fugro from April 27 through April 30, 1998, under the observation of an HAI representative consistent with the FSAP. Borings CPT-1 through CPT-64 and BG-1 were installed in the project area to evaluate shallow stratigraphic conditions and to identify the approximate extent of impacted shallow soils. These borings were also installed to determine if impacted shallow soils were affecting the quality of water and/or sediment in Williams Ditch. Each of the borings was installed using direct push technology to advance Cone Penetrometer Test (CPT) and Laser Induced Fluorescence (LIF) probes until the underlying silt- and clay-rich lacustrine deposits, referred to as a silt/clay unit, were encountered and the full

thickness of LIF response above background within the shallow soils was identified. The locations of the CPT/LIF borings were selected to allow for evaluation of the extent of impacted soils and are shown on Plate 1. Boring BG-1 was installed to allow for consideration of background conditions while interpreting the CPT/LIF data. CPT/LIF logs developed by Fugro are provided in Appendix B. Plate 2 documents the LIF signature thickness based on the CPT/LIF logs.

Geologic cross-sections A-A', B-B', C-C' and D-D', which are shown on Plates 3, 4, and 5, in Appendix D provide an interpretation of shallow stratigraphic conditions encountered in the project area based on data obtained via installation of the CPT/LIF borings. CPT technology is a tool typically used in geotechnical investigations. Subsurface stratigraphy is determined by the ratio between skin friction and tip resistance (Friction ratio, FR) as measured by the probe. A series of standardized curves relate soil type to FR. A set of standard curves, based on the research of Robertson and Campanella (1983) is provided in Appendix B. CPT technology allows for a continuous and consistent record of the subsurface to be obtained. Minute and subtle variations in stratigraphy can be detected due to the continuous nature of the FR determination as the CPT probe is advanced. The consistency of the method between boreholes minimizes the potential human bias which may be introduced during logging and interpretation by a geologist or engineer using traditional hollow stem or test pit approaches. The geologic cross-sections show the approximate limits of the former lagoon areas, Williams Ditch and the LIF response above background. Also provided on the cross-sections are the approximate locations of utilities in the project area and a cross-section profile line location map. As shown on the cross-sections, the project area is characterized by an upper zone of primarily heterogeneous sand/silt/clay deposits most likely associated with reworking of the surficial soils as part of the industrial park development. Some of the sand/silt zones identified by the CPT/LIF borings in the upper zone may be associated with in-situ deposits that have been documented to be present in the vicinity of the project area. Beneath the sand/silt/clay deposits is a laterally continuous silt/clay deposit that has been identified to represent the lacustrine deposits that blanket the project area. Within the silt/clay deposits are silt/sand/clay zones that most likely correspond to thin granular seams/lenses typically encountered in the lacustrine deposits in the region.

A review of the LIF data presented on the CPT/LIF borings was completed to identify depth intervals representing the LIF response above background. The thickness of LIF signature above background (measured in feet below ground surface) was identified for each CPT/LIF boring to determine the thickness of LIF signature above background across the project area. As shown on Plate 2, the thickest intervals of LIF signature above background were, in general, encountered in the vicinity of the former lagoon areas. LIF responses above background extended the deepest below existing grade within and proximate to the limits of the two westernmost suspected former lagoons. Minimum LIF responses above background ranged from zero at several locations, to a maximum depth of approximately eleven feet at boring CPT-46 near the approximate northeast corner of the former lagoon which is overlain by Frenchmens Road. Cross-sections A-A' through D-D' also provide an illustration of the LIF signature above background within shallow soils in the project area. As shown, LIF signatures above background are mostly encountered in the heterogeneous upper sand/silt/clay deposits, and occasionally extend to greater depths within the underlying lacustrine silt/clay deposits where sand/silt/clay seams and/or utilities may serve as preferential pathways. Based upon drawings for the development of Arco Industrial Park, it is strongly suspected that granular backfill around a storm sewer is the primary migration pathway of creosote from the suspected lagoon under Frenchmens Road to Williams Ditch. Superimposing the current location of the storm sewer on to the historical location of the lagoon under Frenchmens Road shows the sewer passing directly through the southern edge of this former lagoon.

A review of the CPT/LIF logs contained in Appendix B, cross-sections A-A' through D-D' in Appendix D, and the LIF signature thickness map provided as Plate 2 indicates that the CPT/LIF borings were successful in providing an understanding of shallow stratigraphic conditions in the project area, as well as identifying the approximate extent of impacted shallow soils potentially affecting the quality of water and/or sediment in Williams Ditch. As shown on Plate 2, the approximate extent of impacted shallow soils has been defined using the LIF data. As shown, the quality of sediment and/or water within Williams Ditch may be affected by impacted shallow soils in the vicinity of borings CPT-17/17A, CPT-18, CPT-19 and CPT-33 installed directly adjacent to the south/east bank of Williams Ditch. The approximate western extent of impacted soils as

identified using the CPT/LIF borings has been determined to be between borings CPT-19 and CPT-20, while the approximate eastern/northern extent has been determined to be between borings CPT-33 and CPT-35.

2.3 Installation of Geoprobe Borings and Test Pits

Ten Geoprobe borings designated SB-1 through SB-10 were installed by Terra Probe Environmental, Inc. on May 6, 1998 under the observation of an HAI representative. Each of the geoprobe borings was installed immediately adjacent to a previously installed CPT/LIF boring, as summarized on Table 3, to allow for a comparison of CPT/LIF data to stratigraphic data obtained via installation of the Geoprobe borings. Locations of the Geoprobe borings are shown on Figure 2. GeoprobeLogs are found in Appendix C.

One soil sample from each Geoprobe boring (i.e., total of ten samples) was submitted to Lancaster Laboratories, Inc. for chemical analysis to demonstrate compliance with the 10% confirmatory sampling requirement specified in the FSAP. LIF technology is a screening tool used to detect the presence or absence of hydrocarbons. Sampling for chemical analysis was done in areas where the LIF response indicated no response and in areas of varied response levels. The objective of the chemical analysis was to confirm the LIF technology was detecting the presence of creosote related compounds, not to gather data for risk-based evaluations or establish clean up levels. The objective of the time-critical removal action is to address immediate source areas of free product or soils saturated with free product. Application of LIF technology for this purpose, as a screening tool, is appropriate. The locations of samples submitted for chemical analysis were selected based on a review of LIF data, with each sample depth selected from the interval representing the LIF response above background. In general, samples were collected from shallow, heterogeneous soils immediately above the silt- and clay-rich lacustrine deposits, referred to as a silt/clay unit on the geologic cross sections. The CPT/LIF data indicated that, in general, the LIF signature above background appeared to be limited to shallow soils above this silt/clay unit (excluding locations where no LIF signature above background was identified). Results of the chemical analysis completed by Lancaster Laboratories, Inc. are provided on Table 4.

A review of the chemical data indicates the highest parameter concentrations to be reported for soil samples collected from within the approximate boundaries of the former lagoon areas. Soil samples collected from Geoprobe borings SB-8 (CPT-48), SB-9 (CPT-16) and SB-10 (CPT-58) exhibited the highest parameter concentrations (in general). SB-8 and SB-9 are located within the approximate former lagoon areas and SB-10 is located near the area defined in the US EPA photographic analysis as an irregular shaped depression which received probable overflow from the lagoons. Elevated parameter concentrations were also reported for samples collected at Geoprobe borings SB-4 (CPT-57) and SB-7 (CPT-56) which were installed immediately adjacent to the former lagoon areas. The soil sample collected from Geoprobe boring SB-5 (CPT-4) exhibited lower parameter concentrations than those reported for samples collected from nearby borings SB-8 (CPT-48) and SB-9 (CPT-16) which were installed within the former lagoon areas, which lends support to soil boring SB-5 (CPT-4) being located between two separate former lagoon areas.

No conclusive correlation between the maximum fluorescence intensity measured by the LIF probe and the measured concentration of creosote related contaminants was apparent. Although in general the higher measured peak fluorescence levels were in the vicinity of the suspected former lagoons and near the former distribution warehouse. The literature reports that peak measured LIF intensity can be a function of contaminant concentration, the laser's excitation energy level, the fluorescing potential of the contaminant (gasoline or diesel will have a higher peak fluorescence than creosote at comparable concentrations) and the matrix in which the contaminant is found. Hydrocarbon contaminants in sandy soil will generally fluoresce more than in clayey soils. Historical aerial photographs show the area impacted by creosote contamination was filled, graded and reworked during the development of Arco Industrial Park, likely intermixing soils and contaminants. Directly comparing peak fluorescence values between CPT/LIF test locations is not appropriate due to the highly disturbed and heterogeneous nature of the reworked lagoon area.

Consistent with the FSAP, test pits TP-1 through TP-6 were installed by Heritage Environmental Services, Inc. (Heritage) on May 7, 1998 under the observation of an HAI representative. As shown on Figure 4, the test pits were installed in close proximity to previously installed CPT/LIF borings to allow for visual characterization of subsurface conditions. Data obtained via installation

of the test pits were used in addition to the Geoprobe borings to further evaluate the CPT/LIF data. Test pit logs are contained in Appendix C, and a summary of installation data associated with the test pits is provided on Table 5.

As previously stated, the Geoprobe borings and test pits were installed to allow for an evaluation of the validity of data obtained via installation of the CPT/LIF borings. Soils encountered during the completion of geoprobe and test pit installation activities were visually characterized by an HAI hydrogeologist. The test pit and Geoprobe logs were compared to the CPT logs as a check. A review of data collected during the initial field investigation indicates that a good correlation exists between the CPT/LIF borings, Geoprobe borings, and test pits. Fugro reviewed the data as well and concurred with this finding. As part of this evaluation, each of the Geoprobe logs were reviewed by Fugro, with the overall conclusion being that, in general, good correlation between the Geoprobe borings and CPT/LIF borings exists. Two samples were collected for geotechnical analyses, one from BG-1 and the other from SB-3. These samples provided another cross check against the CPT information and to provide data on the physical characteristics of the soil for material handling purposes. These data are found in Appendix E.

2.4 Collection of Sediment Samples

Fourteen sediment samples were collected from Williams Ditch (SED-BG and SED-001 through SED-013) by HAI representatives from May 12 to May 15, 1998. Each of the sediment samples were collected at the proposed locations presented in the FSAP. Sediment sample locations are shown on Figure 3. Each sample was collected consistent with the procedures presented in the FSAP and submitted to Lancaster Laboratories, Inc. for chemical analysis. Table 6 is a summary of sediment sample collection activities, including date/time of collection and general notes associated with sample collection. Results of the chemical analysis of sediment samples are provided on Table 7.

A review of the chemical data indicates the highest parameter concentrations for sediment samples reported was for sediment sample SED-005. Sediment sample SED-005 was collected in close proximity to the former lagoon areas and surface water sample SW2, and as discussed in Section

2.2, is located within the approximate extent of impacted shallow soils that may be potentially affecting the quality of surface water and/or sediment in Williams Ditch. SED-005 was taken where the storm sewer that passes through the suspected former lagoon under Frenchmens Road discharges into Williams Ditch. A dark, viscous material saturates the sediment at this location. Sediment sample SED-004 was collected from the approximate western (i.e., upstream) extent of impacted shallow soils as determined using the CPT/LIF borings, with decreasing parameter concentrations reported for sediment samples collected further upstream. Similarly, sediment sample SED-006 was collected downstream from the approximate extent of impacted shallow soils, with sediments samples collected further downstream exhibiting parameter concentrations significantly less than those reported for sediment sample SED-005.

2.5 Collection of Ambient Air Samples

Nine ambient air samples were collected to evaluate baseline or background conditions at the site prior to initiating further intrusive removal actions. Eight baseline samples included polyaromatic hydrocarbons (PAHs) volatile organic compounds (VOCs) and particulate matter less than 10 microns (PM-10) and one was only for VOCs (taken as background for the second "worst case" event). PAH samples were collected according to US EPA method TO-13, using a polyurethane foam (PUF) sampler. VOC samples were collected using 6 liter stainless steel *Summa* canisters. PM-10 samples were collected according to the US EPA reference prescribed in 40 CFR Part 53, Subpart D 52.

Baseline air monitoring locations (AMLs) were selected based upon historical meteorological data to ensure adequate representation of upwind, crosswind and downwind of the lagoon area of the Site. Two "worst case" air samples for VOCs, one from a typical soil excavation area near the westernmost lagoons by TP-6 and one from contaminated sediments in Williams Ditch near SED-005, were collected to identify pollutants which may impact ambient air during removal activities. The results of the initial baseline/worst case study, performed by HAI's subcontractor, Derenzo and Associates, Inc., (Derenzo) between May 27 and May 29, 1998 are included in a separate document titled "Results of Ambient Air Monitoring at the Toledo Tie Treatment Site in Toledo, Ohio" (Derenzo, August 1998). Derenzo's data show nominal concentrations of air pollutants at the perimeter of the site and no appreciable impact on ambient air quality due to emissions from

the Site in its undisturbed state. Although VOC pollutants were detected at elevated levels immediately adjacent to the "worst case" soil excavation location, the levels were far below permissible occupational and health exposure levels. Similarly, results of the worstcase air sample collected during trial excavation of sediments on August 13, 1998, in Williams Ditch near sample SED-005 indicated VOC pollutants were released at levels below established permissible occupational and health exposure levels. The results of this sampling event are tabulated on Table 8.

VOCs detected in the worst case samples collected in May 1998 included benzene, chloromethane, toluene, ethyl benzene, m,p-xylene, o-xylene, 1-3,5- and 1,2,4- trimethylbenzene, acetone, 1,4-dioxane, and 4-ethyltoluene. Tentatively identified compounds (TICs), outside of the TO-14 list, included naphthalene and various semi-volatile, hydrocarbon derived pollutants. Similar pollutants were detected in the August 1998 worse case sample with the exception of chloromethane, acetone and 1,4-dioxane. The VOCs detected during the worse case sampling events are typically found in urban areas as by-products of hydrocarbon combustion or industrial processes. The May 1998 worst case sample was collected over a one-hour period immediately downwind and adjacent to a trial excavation. Excavated material was placed upwind of the sample location and the bucket of the backhoe placed immediately next to the *Summa* canister as material was removed from the hole. The August 1998 worst case sample was collected over an approximately three minute period where the *Summa* canister was placed within the backhoe bucket containing creosote saturated sediment. The shorter duration of this test was at the request of the US EPA.

PAHs are ubiquitous in the atmosphere as a result of hydrocarbon combustion associated with automobile and truck exhaust. Fluorene, phenanthrene, fluoranthene, and naphthalene were detected in sub-ppbv concentrations at all AMLs around the perimeter of the site during the background air sampling event and worse case sampling event in May 1998. Anthracene was detected only at AML-2 and AML-3 at sub-ppbv concentrations. Benzo(a)pyrene was not detected at any location during any sampling event. There was no appreciable increase in parameter concentrations over background levels at the perimeter as a result of the controlled excavation in May 1998, even though naphthalene was detected at 290 ppbv immediately adjacent to the excavation and the naphthalene odor was detected at some distance downwind. Similarly, during

the worst case air sampling event on August 13, 1998, although the odor persisted downwind, hand held air monitoring instrumentation did not detect any concentrations of hydrocarbons or naphthalene in the breathing zone.

Napthalene has a coal tar or "moth ball" type odor which is readily detected at concentrations well below the occupational exposure limits established by the Occupational Health and Safety Administration (OSHA). The geometric mean air odor threshold for napthalene is 0.038 ppm, which is below the direct measurement capability of most hand held air monitoring equipment. The odor threshold is reported to range from 0.0095 ppm to 0.64 ppm. People with poor sense of smell or smokers may not detect the napthalene odor until concentrations in the air approach the 0.64 ppm range. The permissible exposure limit (PEL) of napthalene, which is the enforceable standard set by OSHA, is 10 ppm and represents the maximum concentration workers may be exposed to, without respiratory protection, over an eight-hour day and 40-hour work week. Napthalene is susceptible to photolytic degradation in the atmosphere. The half life of napthalene is three to eight hours, often breaking down within a day after entering the atmosphere.

Benzene was detected at 500 ppbv in the worse case air sample collected on August 13, 1998 and at 19 ppbv in the worse case grab air sample at the controlled soil excavation in May 1998. The higher concentration is from near sediment sampling location SED-005 in Williams Ditch where sediment, saturated with dark, viscous product, was observed. Minimal product was observed during the controlled excavation near TP-6 on May 28, 1998, which correlates with the lower measured concentrations of VOCs. A distinct napthalene odor was detected, however, the measured concentration of benzene in both worst case air samples is below the PEL of 1 ppm established by OSHA.

Other VOCs detected during the worst case air sampling events were present at concentrations far below the enforceable PEL. Toluene has a PEL of 200 ppm. Xylene, trimethylbenzene and ethylbenzene all have a PEL of 100 ppm. The highest measured concentration of any of these compounds, in either of the worstcase air samples, was 1.58 ppm of total xylene.

3.0 RATIONALE FOR TECHNICAL APPROACH

Section IV, Item 6 of the Unilateral Administrative Order (UAO) identifies the primary factors, pursuant to Section 300.415(b)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), driving the implementation of time critical removal activities at the Toledo Tie Treatment Site. The proposed remedy addresses these driving forces by mitigating potential migration and exposure pathways through source removal and engineering controls. The time-critical remedy selected by KMC is:

1. Excavation of sediment to remove the most immediate source of contamination to the waters of Williams Ditch.
2. Removal of immediate source areas in and around the two westernmost lagoons and Williams Ditch.
3. Removal and replacement of a storm sewer which passes through the suspected former lagoon which lies beneath the current location of Frenchmens Road.
4. Installation of engineering controls in the form of a subsurface barrier system with a french drain to control potential future migration to Williams Ditch and to address areas of residual contamination.

The proposed remedy was selected because:

1. Creosote related contamination in the sediments accumulated in Williams Ditch was confirmed by sampling and geochemical data. Removal of this source of contamination to the water in Williams Ditch was considered the most effective option in preventing continued contamination. The limits of excavation are based upon analytical data and physical observations which indicate the presence of creosote related contaminants at sampling location SED-009 and the apparent absence of creosote related contaminants at sampling location SED-010.

2. The immediate source of the creosote contamination to the sediments and waters of Williams Ditch is identified as the two, westernmost lagoons. This determination is based upon the proximity of these lagoons to the observed accumulation of creosote product in Williams Ditch, evaluation of the geological data gathered during the CPT/LIF investigation, physical site observations, historical aerial photographic evidence, and available engineering drawings which show a storm sewer traversing the former location of the suspected lagoon which lies beneath the current location of Frenchmens Road. Creosote related contamination was confirmed in the soil in these areas and a probable direct migration pathway through the backfill of the storm sewer from these areas to the ditch was identified.
3. Removal and replacement of the storm sewer and construction of a subsurface barrier/ french drain will significantly reduce the potential for future creosote migration to Williams Ditch and provide a mechanism for capturing residual creosote that may remain after the immediate source has been removed.

Removal of the immediate source of creosote contamination in Williams Ditch and installation of engineering controls, as described above, are consistent with Section V, Items 3.5 and 3.7 of the UAO.

4.0 IMPLEMENTATION OF THE REMEDY

During the time critical removal process, the immediate source areas will be excavated, infrastructure will be removed and replaced as needed, sediment in Williams Ditch will be excavated, and a subsurface barrier system will be constructed. The following is a brief description of the activities required to implement these tasks.

4.1 Lagoon Excavation and Infrastructure Removal

KMC has selected Peoria Disposal Company, (PD.) in Peoria, Illinois as the preferred off-site disposal facility. Transportation and disposal of excavated materials is the planned method of handling contaminated soils and sediment. PDC has been used by KMC for previous projects involving wood treatment sites and is in compliance with §300.440 of the National Contingency Plan. KMC will contract directly with PDC for disposal of contaminated material. Should ITC be able to demonstrate that thermal desorption is reasonably achievable, available, and is competitive, thermal treatment could be an option. This decision would be made by KMC if necessary, prior to initiating off-site shipment of excavated material. Incineration of raw creosote product, if sufficient quantities are recovered to justify handling of a separate waste stream, may also be considered by KMC. Excavated soils/sediments will be classified as F034 under 40 CFR, Subpart D §261.31. The F034 waste code was chosen based upon the previous use of the facility, the analytical data and precedent. There is no information that KMC has or that previous investigations have identified to suggest any other wood treating compounds other than creosote were ever used at the facility. F034 results from preservative drippage, wastewaters (except those that have not come into contact with process contaminants, residual creosote product or spent formulations associated with the treatment of wood with creosote. Analytical data support this classification as no chlorinated compounds, such as pentachlorophenol, were detected in any of the samples collected for analysis. KMC manages waste from at least seven remediation projects at wood treatment sites under the F034 code, including the Moss-American site in Milwaukee, Wisconsin which is within the jurisdiction of Region V of the US EPA. ITC will provide a full time on-site waste management coordinator to track transportation and disposal activities.

4.1.1 Excavation, Backfill, and Site Grading

The area indicated on Sheet 2 of the plan set will be excavated to the subsurface lacustrine clay layer which is at an average depth of approximately eight feet or to the depth at which the immediate source is no longer distinguishable. Under the time-critical removal action, an immediate source is defined as free flowing, creosote product or soils/sediment saturated with creosote product which is encountered within the limits shown on the plan set. Areas where there may be water with residual creosote contamination or visible sheening, but no readily visible or distinguishable presence of immediate source will be noted and addressed during the implementation of non-time critical activities. Excavation will extend to the limits shown on Sheets 2, 3 and 4 of the plan set based on these criteria. Should free flowing, creosote product or soils saturated with creosote product be observed at the perimeter of the excavation as noted on the drawings, the impacted soils or product will be removed to the extent practicable and a physical barrier placed at the terminus of the excavation.

Surficial soils along with existing grasses, not visually impacted by creosote nor exhibiting visual signs of being saturated by a water/creosote mixture, will be stockpiled separately and used to replace excavated source material. The contractor plans to replace soils immediately behind the excavation so as to minimize the area that is open at any one time. These soils will be placed first, at the terminal depth of the excavation, and covered with clean, off-site fill material. Off-site material will first be characterized for the same parameters used in the May 1998 field investigations of on-site soils.

A physical barrier, such as a polyethylene geomembrane, will be placed between areas where native or clean off-site fill has replaced excavated source material and areas where residual creosote contamination is observed in the form of water which exhibits visible sheening. Similarly, a barrier may be placed between backfilled areas and areas where there may be residual staining/odor, but no observed product or limited product in discontinuous seams or lenses.

There are several underground utilities located within the excavation area. Refer to the plan set and Section 4.1.2 for details regarding excavating near these utilities and the removal and replacement of some of the utilities present.

An effort will be made to segregate the excavated soil by its level of visual contamination, if possible. The data show creosote related contamination resides within an upper sand/silt stratum and rests upon a lower confining layer of lacustrine silts/clays, typical of a dense, non-aqueous phase liquid (DNAPL) plume. Observations during test pit excavation were that the DNAPL was present in thin bands or seams within the sand/silt layer and was not distributed homogeneously through the stratum. The data support limiting the excavation to the limits shown on the drawings, in accordance with the above definition of immediate source considering the other controls that will be in place. The area will be backfilled in accordance with the final grade indicated in the plan set. This will be done in conjunction with the construction of the subsurface barrier system, the removal of the utilities as listed below, and the reconstruction of Frenchmens Road. Where schedule, weather conditions and/or moisture content of the excavated soil allows, ITC may consider using material removed from the lagoon area to mix with excavated sediment to bulk up or stabilize wet sediment prior to transportation and disposal. Based upon available data and site observations, it is estimated that on the order of 10,000 to 11,000 cy of contaminated material may have to be removed off-site.

4.1.2 Utility Removal and Replacement

Refer to Sheet 3 of the plan set for all utility removal work. Storm sewer pipes #6-#11, a portion of #5 and associated fixtures will be removed. Storm water controls will be reinstalled, subject to City of Toledo concurrence with the proposed infrastructure modifications, to insure the proper management of storm water in this area. The City of Toledo Department of Utilities requires that the 8" water main be removed prior to excavation of the lagoon areas and replaced upon completion of removal activities.

Columbia Gas's 4" low pressure gas line will be temporarily removed or isolated to facilitate the excavation. It is currently anticipated that the underground Ameritech lines and sanitary sewers will not be removed. Sanitary, water, and electric service must be maintained to the distribution

warehouse during and after removal activities. The warehouse was recently leased for storage purposes and in accordance with the existing negotiated access agreements, KMC is obligated to accommodate property owners to the degree possible. Coordination with Ameritech, Toledo Edison, and Columbia Gas will be necessary during the construction of the french drain. Toledo Edison will provide support during excavation activities to maintain the integrity of the existing above ground electrical service.

Potential migration pathways along subsurface utility corridors, primarily the water line and storm sewer running east-west along Frenchmens Road, will be addressed by sealing around the pipes/trenches with a geosynthetic material boot to the conduit. This seal applies to the Columbia Gas service line (if applicable) and to where the re-installed stormsewer may penetrate the membrane of the subsurface barrier wall/french drain.

The utilities have been contacted and the project discussed with them. Any excavation, backfill, site grading, and construction activities performed near these utilities will need to be coordinated with the appropriate organizations.

4.1.3 Road Replacement and Removal

For a delineation of the portion of Frenchmens Road to be removed and replaced, refer to Sheet 3 of the plan set. Sheets 5 and 6 provide detailed information on the replacement road.

The removal of immediate source in this area necessitates the removal and replacement of this portion of Frenchmens Road to insure proper management of the surface water in the area. Contributory drainage areas adjacent to Frenchmens Road will be regraded to ensure that the City of Toledo requirements for stormwater control and pipe sizing are met. A temporary sump may be placed at the eastern limit of the excavation area on Frenchmens Road to accommodate stormwater flow in the portion of the storm sewer that is not being removed. Accumulated stormwater will be routed back to Williams Ditch provided no visible oil or oil sheen is observed.

4.2 Sediment Removal

4.2.1 Sediment Excavation and Backfill

Sediment will be removed from Williams Ditch beginning on the east side of Arco Drive and terminating halfway between sample locations SED-009 and SED-010. A minimum of two feet will be removed in all areas delineated on the plan set, resulting in an estimated 2,200 cy of material being removed.. Confirmation of excavation depth will be made using a combination of visual observation and field fluorescence techniques. Additional excavation beyond the two feet minimum may be necessary, depending upon field observations. The City of Toledo Department of Utilities has indicated that backfilling of the ditch to replace excavated areas is not necessarily required provided the current hydraulic capacity of Williams Ditch is maintained. Should additional restoration be needed to maintain the current hydraulic capacity, the ditch can be backfilled with either general soil fill or lined with a flexible membrane liner and filled with gravel. The design grade prescribed in the City of Toledo's Comprehensive Ditch Plan can be used as a guide. A copy of the current ditch plan is provided for reference in Appendix F. Field conditions at the time of excavation/backfill will dictate which method is selected.

Laboratory tests conducted by Peoria Disposal Company (PDC) for waste characterization and handling purposes indicate sediment, in its current state without dewatering, will not pass the standard paint filter test. ITC anticipates that additional dewatering or bulking the sediment will be necessary prior to transporting off-site. The sediments will be allowed to air dry in the ditch prior to excavating or handling. A staging area north of Frenchmens Road will be established to manage the sediment. Depending on how successful air drying in the ditch is, some mechanical means, such as a belt filter press, or a dry additive, such as quick lime or lime kiln dust, may be necessary to condition the sediment for off-site disposal. Sediments which are stabilized prior to disposal at PDC, must meet the requirements of Title 35 – Illinois Environmental Protection Act, SubPart G 729.310 (b)(3). Stabilized materials must demonstrate an unconfined compressive strength of 2 TSF. It may be possible to bulk soils from the lagoon excavation with the sediments and ITC has requested this flexibility since the Rule 729.310 (b)(3) would not apply in this instance.

Water which may be derived from dewatering of the sediments will be placed into a series of on-site storage tanks to settle suspended particles and decant any visible oil or oil sheen. Initial testing according to the City of Toledo POTW requirements (Chapter 930 of the Toledo Municipal Code) of the final tank will be performed to assess water quality. If the results indicate that the water quality is better than that currently existing downstream of the work area, then ITC proposes to release the water back into Williams Ditch. Should the analytical data show water quality is worse than the water in Williams Ditch, and is acceptable for discharge to the City of Toledo POTW, then an on-site sewer discharge will be made, provided the City authorizes a discharge. Any discharges to the POTW would be batch discharges at a controlled rate set by the City. A copy of Chapter 930 and the maximum acceptance limits are included in Appendix G.

4.2.2 Williams Ditch Rerouting

The contractor has proposed to isolate the ditch by installing a coffer dam or soil plug in Williams Ditch immediately downstream of Arco Drive. A sump arrangement, fitted with pump(s), will be used to convey water through a pipe around the effected portion of Williams Ditch. Accumulated water which remains in the effected portion of the ditch will be pumped ahead of the rerouted area. Should there be visible sheen, the water will be pumped through a series of temporary storage tanks, to settle out the solids and remove any visible oil or oil sheen. This water will then be discharged downstream beyond the effected portion of the ditch. The contractor may install sand trenches/sumps along the ditch or isolate the ditch in discrete sections to control stormwater which may accumulate in the ditch once the bypass is put in place. The siphon dams will remain in place until it has been demonstrated by visual observation that the water in Williams Ditch is free of visible oil or oil sheen. Water will need to be rerouted during the sediment excavation, and soil backfill activities.

4.3 Subsurface Barrier (French Drain)

A french drain will be constructed to address the residual contamination that is not removed during the excavation portion of the time critical removal action and to provide a redundant mechanism to protect sediment and surface water in Williams Ditch.

4.3.1 Excavation

The subsurface barrier will be installed once the storm sewer, associated backfill near Williams Ditch has been removed, and the banks of Williams Ditch, where it may be necessary to remove them have been reconstructed. Construction of the french drain will be closely coordinated with lagoon excavation and initiation of sediment removal west of Arco Drive. Placing the subsurface barrier in the initial stages of the project provides the benefit of isolating the immediate source from Williams Ditch. See Sheet 4 in the plan set for construction details.

*east or west
of Arco Dr.*

4.3.2 Construction

A flexible geomembrane sheet, 60 mil high density polyethylene, will provide the barrier component of the subsurface engineering control. Since the excavation area of the westernmost lagoon was expanded northward to Williams Ditch, it will be possible to rebuild the banks of the ditch, making deployment of a flexible membrane preferable to sheet piling which could impede the excavation and require a duplication of effort to install the drainage piping. The gravel, geotextile filter wrap, and pipe will be laid in place once the geomembrane is in place. A free draining sand or geocomposite material should be placed against the geomembrane prior to backfilling to facilitate potential drainage of creosote into the french drain piping. The sump will be constructed and each leg of the french drain connected to the sump. Then, the excavation will be backfilled with clean soil to the final grade indicated in the plan set.

4.3.3 Operation

Liquids entering the french drain pipes will drain to the sump. DNAPL which accumulates in the sump will be removed and water, once treated, is planned to be discharged to the City of Toledo sewer system. Any discharge of water would be in accordance with City of Toledo Standards, which are described in Appendix G. A Warren-Rupp, double diaphragm pump or similar, using a footer valve or similar set up will be used. The operational concept is to maximize the collection of creosote product and minimize water production. A float system, with a dial up alarm system to alert KMC of system in operation or excessive liquid level, will be incorporated. Alternately, a timer mechanism may be used if it proves more effective in drawing free product to the french drain. A timer mechanism may be preferable to a float system as maintenance could become problematic due to product build up on the float(s).

4.4 Required Contractor Submittals

4.4.1 Site Specific Health and Safety Plan (HASP)

HAI has prepared a HASP addressing the requirements for the anticipated activities at the former Toledo Tie Treatment Site. This document is located in Appendix B of the Removal Action Work Plan. The minimum provisions of this plan are mandatory for all project personnel entering the site as well as site visitors. It should be acknowledged that the employees of other consulting and/or contracted companies may work in accordance with their own independent HASP's if it is more or as stringent as the one submitted by HAI. At a minimum, this document should be submitted to KMC for review prior to initiating any intrusive on-site activities.

ITC is responsible for developing and implementing a HASP that addresses anticipated site health and safety concerns for its employees and subcontractors, if any, and specifically focuses on project tasks scheduled to be performed. The plan should also present required information including, but not limited to: identification of key personnel and lines of communication, training, medical surveillance, site hazards, work zones, personal safety, ambient and personal air monitoring, respiratory clearance, equipment cleaning and material safety data sheets, heat stress monitoring for permeable and non-permeable clothing, respirable contaminant action levels, levels of PPE, and emergency contingencies (i.e., injury, chemical release, etc.). Frequency and location should also be taken into consideration. As applicable, these criteria should be in document form and reviewed by KMC. Copies of training(s) should be tabulated and submitted as one bound document. Note all persons entering the site must show proof of OSHA 40-hr training, 8-hr refresher training, medical surveillance, and respirator clearance before they will be permitted to enter the site.

←
Need to re
ITC HA

4.4.2 Stormwater Management Plan

The selected contractor will be responsible for ensuring that all stormwater is properly managed and segregated. Portable water holding tanks may be used to contain stormwater from excavations and, if needed, to serve as a holding mechanism for decontamination water.

4.4.3 Dust/Odor Control Plan

Visible dust emissions will be addressed by periodically applying misted water or using an equivalent approach. ITC has proposed to use a chemical deodorizer to control odors if needed. A detailed plan describing engineering controls, traffic control measures, etc. will be required.

4.4.4 Air Monitoring Plan

The contractor will be responsible for conducting ambient and personal air monitoring throughout the duration of all intrusive construction activities. ITC will conduct its own baseline air monitoring program to establish background levels of VOCs and PAHs. Based upon the data gathered during the May and August 1998, air sampling events, it appears that routine monitoring with hand held instrumentation will be adequate for detection of VOC's both in the work zone and at the perimeter. Since benzene was detected however, organic vapor badges will be required to be worn by the worker(s) with the greatest potential for exposure, until such time as analytical data indicates that it is not present at levels above the PEL. In addition, organic vapor badges can be placed at the perimeter to evaluate whether benzene is present. Personnel sampling for PAHs will also be required until it can be demonstrated that levels are below the PEL. ITC has received the data included in Table 8 and the data summary from the Derenzo report. Action levels, based upon these site specific chemical data are being developed and will be incorporated as an amendment to the site HASP prior to initiating excavation activities.

where are
action levels



4.4.5 Dewatering/Stabilization Plan

The selected contractor will be required to submit a detailed plan for handling and management of contaminated sediments/soils. This plan must also include a liquids management program incorporating at a minimum, details for the recovery, management, treatment (if any), and disposal of potentially contaminated water. Anticipated sources of potentially contaminated water include, but are not limited, to decontamination water, water entering excavations which contacts immediate

source or water draining from excavated soils or sediments. The City of Toledo WWTP is the preferred receptor of potentially contaminated water from the site and negotiations are ongoing to provide this capacity.

4.4.6 Contingency Plan

The site contingency plan will be amended as needed to address such things as on-site or off-site spills of materials leaving the site, traffic emergencies, etc. The amended plan will be distributed to the parties previously contacted and prior to initiating construction, reviewed with them.

4.4.7 Traffic Plan

ITC will be required to provide a traffic plan which identifies the proposed routing of trucks, staging of equipment, materials, contaminated soils/sediments, etc. and establish a schedule of the number and types of trucks, etc.

4.4.8 Project Schedule and Management Plan

ITC will be required to provide a project schedule which parallels to the degree practicable, the preliminary one shown in Figure 8. Written documentation regarding cost control procedures, project personnel, the chain of command with decision making authority defined, and

5.0 REFERENCES

A variety of technical documents, administrative documents, and publications were referred to during the preparation of this document. Some of the references consulted are presented below.

HAI. Removal Action Work Plan for the Toledo Tie Treatment Site, Hull & Associates, Inc. April 1998.

U.S.EPA. Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans. United States Environmental Protection Agency. 1983.

U.S. EPA. A Compendium of Superfund Field Operations Methods, United States Environmental Protection Agency. 1987.

American Society of Testing and Materials. "ASTM Standards Relating to Environmental Site Characterization", ASTM Publication Code Number: 03-418297-38, 1410 pp. 1997.

U.S EPA. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition. United States Environmental Protection Agency. 1986.

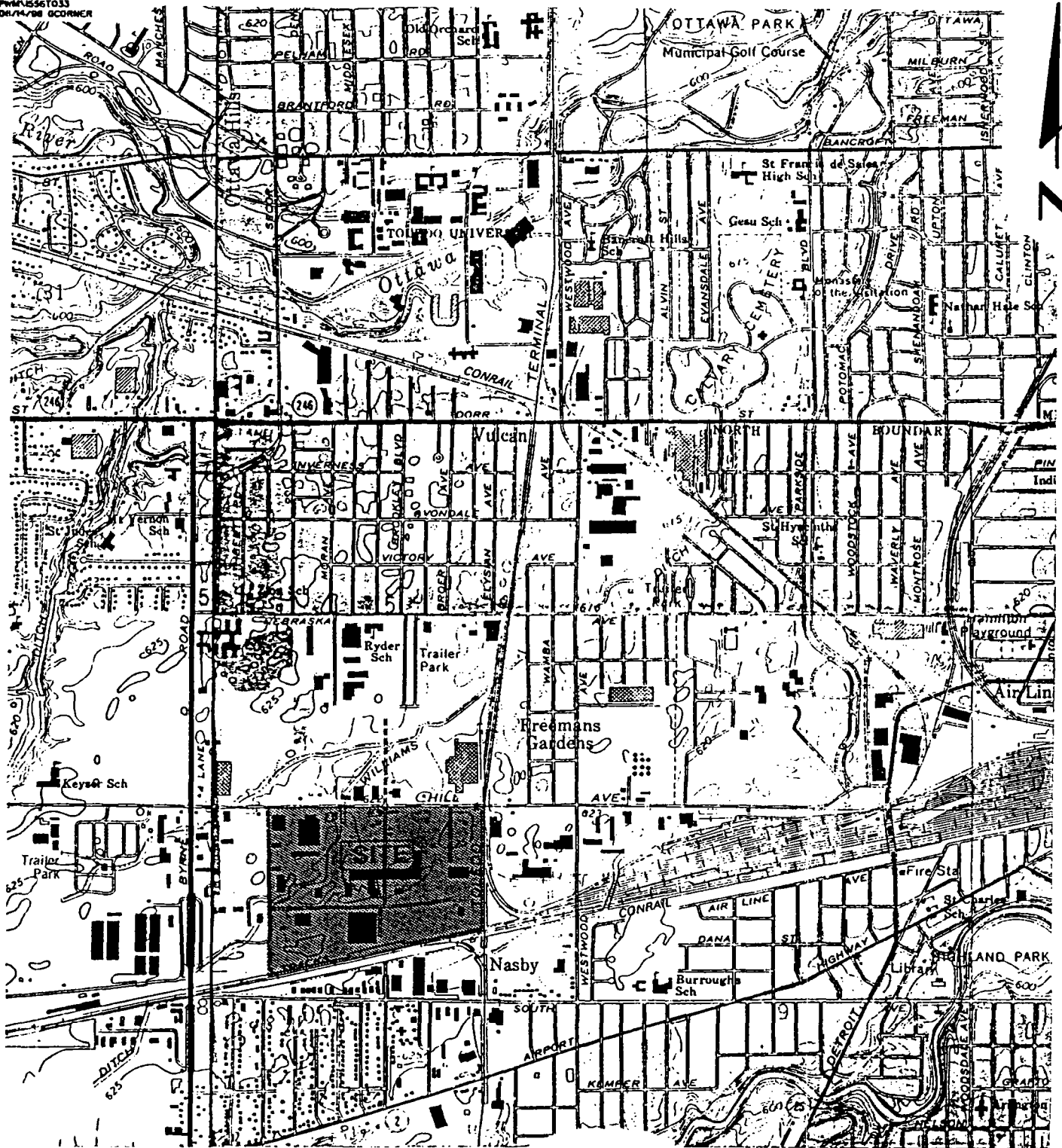
U.S. EPA. Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020. United States Environmental Protection Agency. 1983.

HAI. Appendix A. Field Sampling and Analysis Plan, Toledo Tie Treatment Site, Hull & Associates, Inc. April 1998.

HAI. Appendix C. Quality Assurance Project Plan, Toledo Tie Treatment Site, Hull & Associates, Inc. April 1998.

U.S. EPA. Approaches for Remediation of Uncontrolled Wood Processing Sites, Office of Research and Development, United States Environmental Protection Agency, EPA/625/7-90/011, November 1990.

- U.S. EPA. Presumptive Remedies, Technology Selection Guide for Wood Treatment Sites, Office of Solid Waste and Emergency Response, United States Environmental Protection Agency. EPA540-F-93-020, April 1993.
- U.S. EPA. Contaminants and Remedial Options at Wood Processing Sites, Office of Research and Development, Risk Reduction Engineering Laboratory, EPA/600/R-92/182, October 1992.
- U.S. EPA. Aerial Photographic Analysis, Toledo Tie Treatment Plant, Toledo, Ohio, Office of Research and Development, United States Environmental Protection Agency, TS-PIC-9805537S, May 1998.
- U.S. EPA. Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA, Office of Solid Waste and Emergency Response, United States Environmental Protection Agency, EPA540-R-93-057, August 1993.
- U.S. EPA. Toxicological Profile for Creosote (Update), Agency for Toxic Substances and Disease Registry, United States Department of Health and Human Services, PB97-121024, August 1996.
- U.S. EPA. Air Pathway Analysis, Office of Emergency and Remedial Response, United States Environmental Protection Agency, EPA/540/S-92/013, November 1992.
- U.S. EPA. Air/Superfund National Technical Guidance Study Series, Volume V - Procedures for Air Dispersion Modeling at Superfund Sites, Office of Air Quality Planning and Standards, United States Environmental Protection Agency, EPA-454/R-95-003, February 1995.
- U.S. EPA. Air/Superfund National Technical Guidance Study Series, Evaluation of Short-Term Air Action Levels for Superfund Sites, Office of Air Quality Planning and Standards, United States Environmental Protection Agency, EPA-454/R-93-009, May 1993.
- U.S. EPA, et al. Canister Based Method for Monitoring Toxic VOCs in Ambient Air, J. Air Waste Management Association, Volume 41. No. 10. October 1991.



**QUADRANGLE
LOCATION**

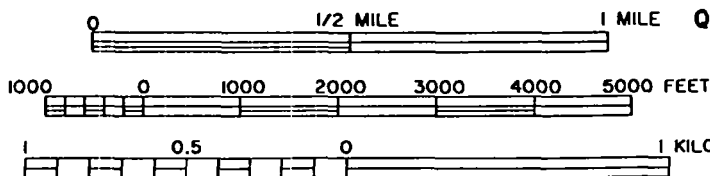


FIGURE I

Hull & Associates, Inc.
TOLEDO, OHIO

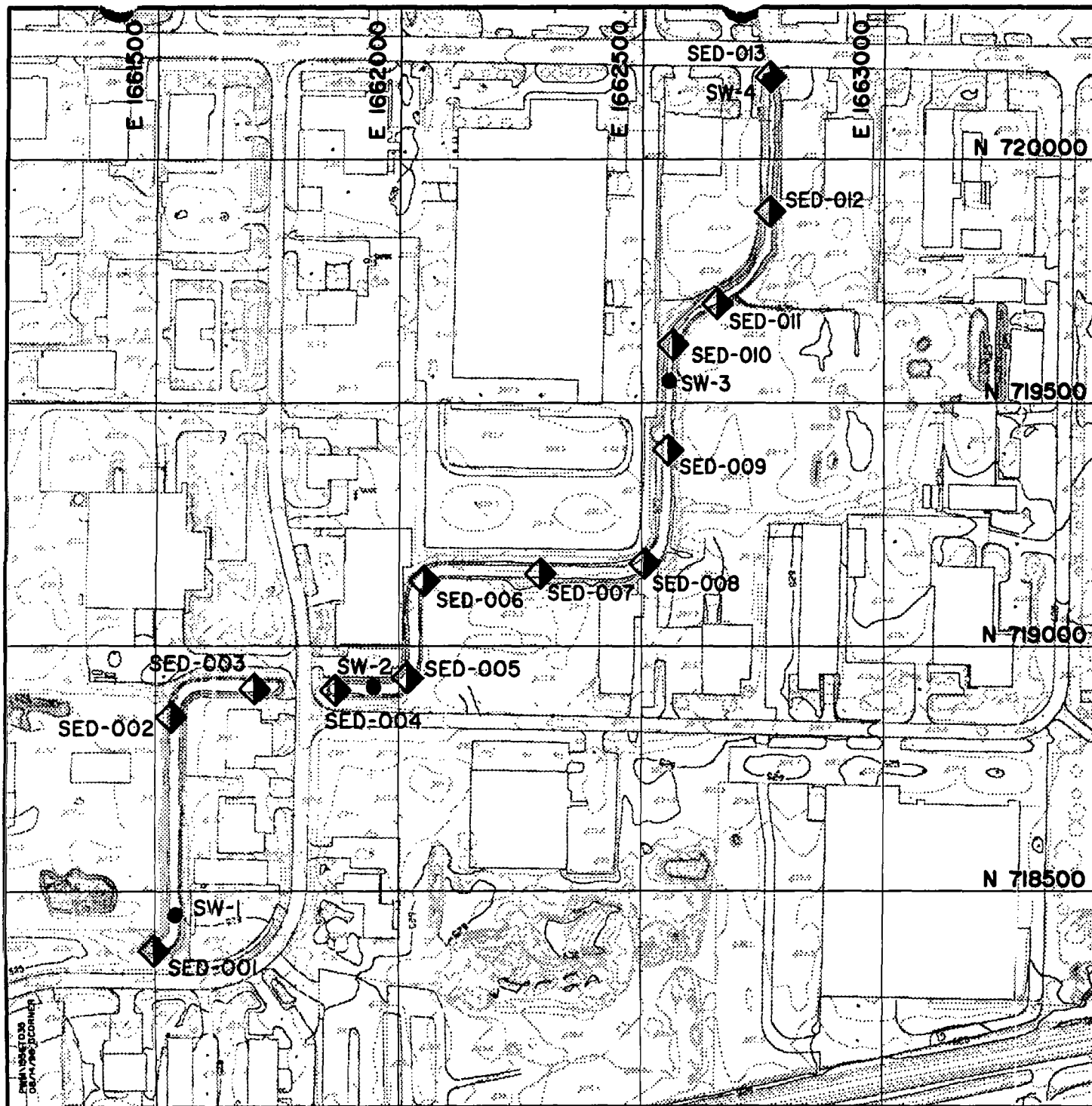
KERR-McGEE CHEMICAL, LLC.
TOLEDO TIE TREATMENT SITE
TIME CRITICAL REMOVAL PLAN

SITE LOCATION MAP

CITY OF TOLEDO, LUCAS CO., OHIO

DATE:
AUGUST 1998

PWM001



LEGEND



- SED-010  SEDIMENT SAMPLE LOCATION
- SW-3  SURFACE WATER LOCATION

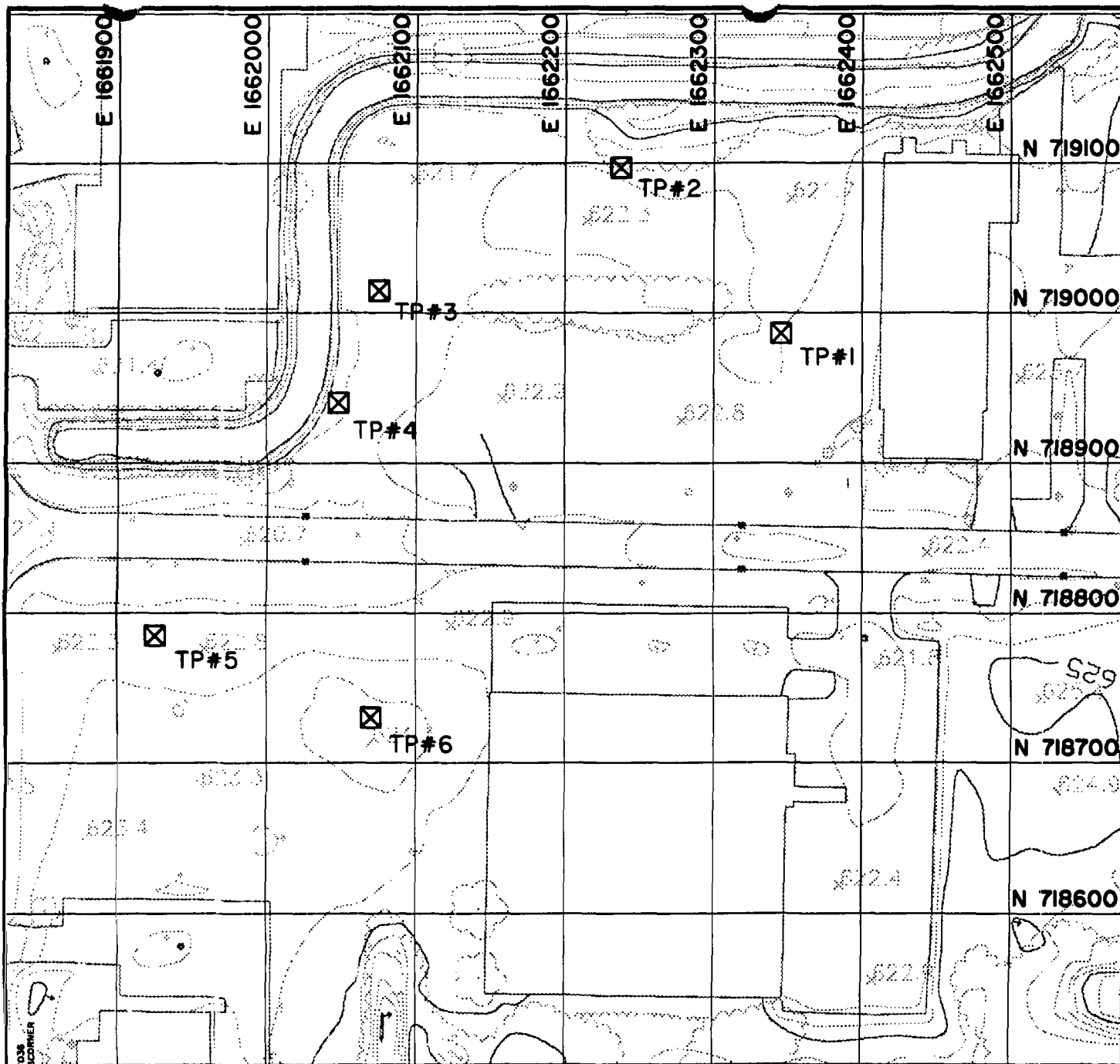
FIGURE 3

Hull & Associates, Inc.
TOLEDO, OHIO

KERR-MCGEE CHEMICAL, LLC.
TOLEDO TIE TREATMENT SITE
TIME CRITICAL REMOVAL PLAN
**SEDIMENT AND SURFACE
WATER SAMPLING LOCATIONS**
CITY OF TOLEDO, LUCAS CO., OHIO

DATE:
AUGUST 1998

PWM001



0 50 100
SCALE IN FEET

LEGEND

TP#3  TEST PIT LOCATION

FIGURE 4

Hull & Associates, Inc.
TOLEDO, OHIO

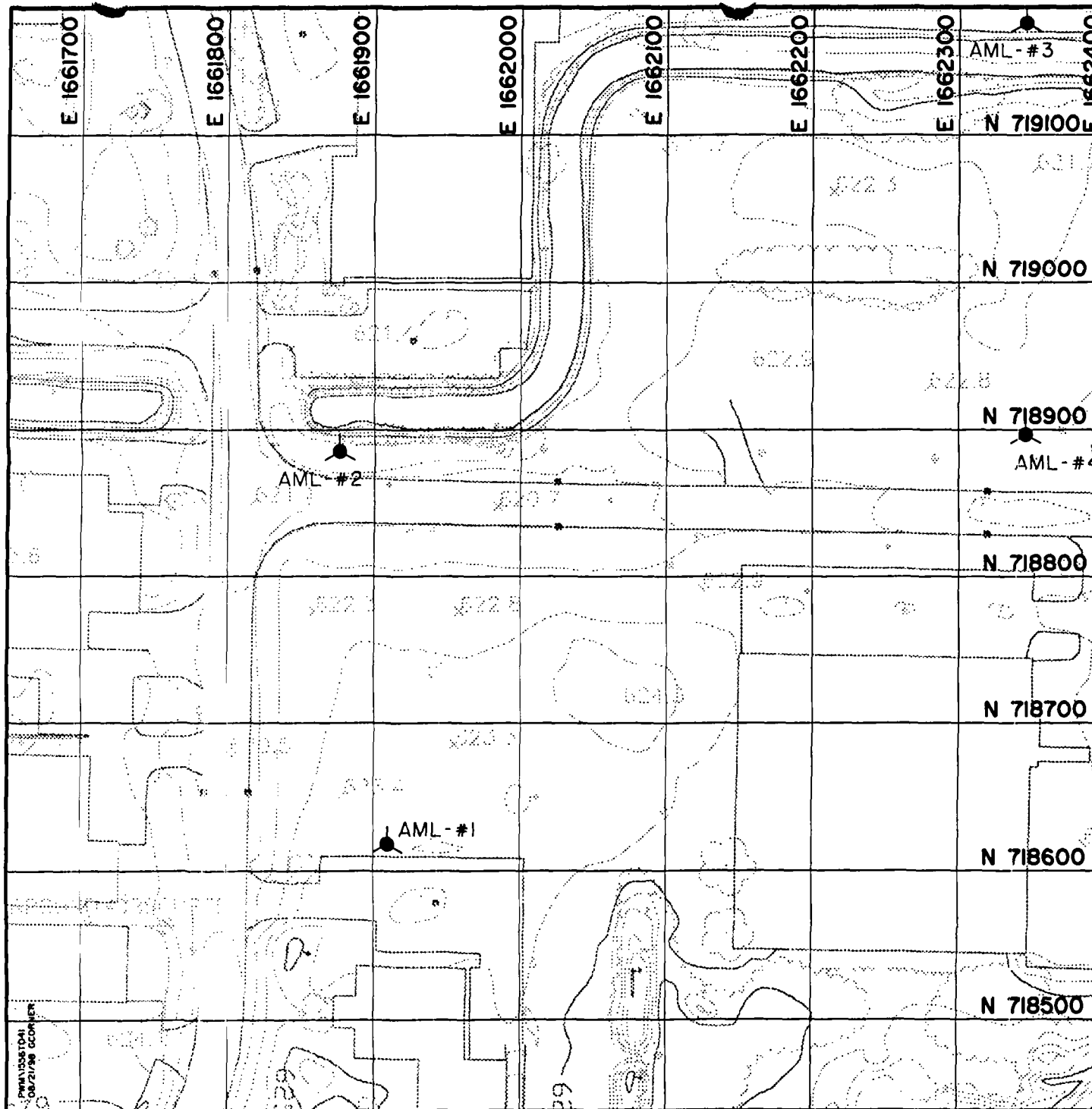
KERR-McGEE CHEMICAL, LLC.
TOLEDO TIE TREATMENT SITE
TIME CRITICAL REMOVAL PLAN

TEST PIT LOCATIONS


CITY OF TOLEDO, LUCAS CO., OHIO

DATE:
AUGUST 1998

PWM001



LEGEND


AMBIENT AIR MONITORING SITES
 (NUMBERED BY DERENZO AND ASSOCIATES)

AML-#4

NOTE: 24 HOUR SAMPLING
 EVENTS CONDUCTED
 MAY 27 & 29, 1998.

FIGURE 5

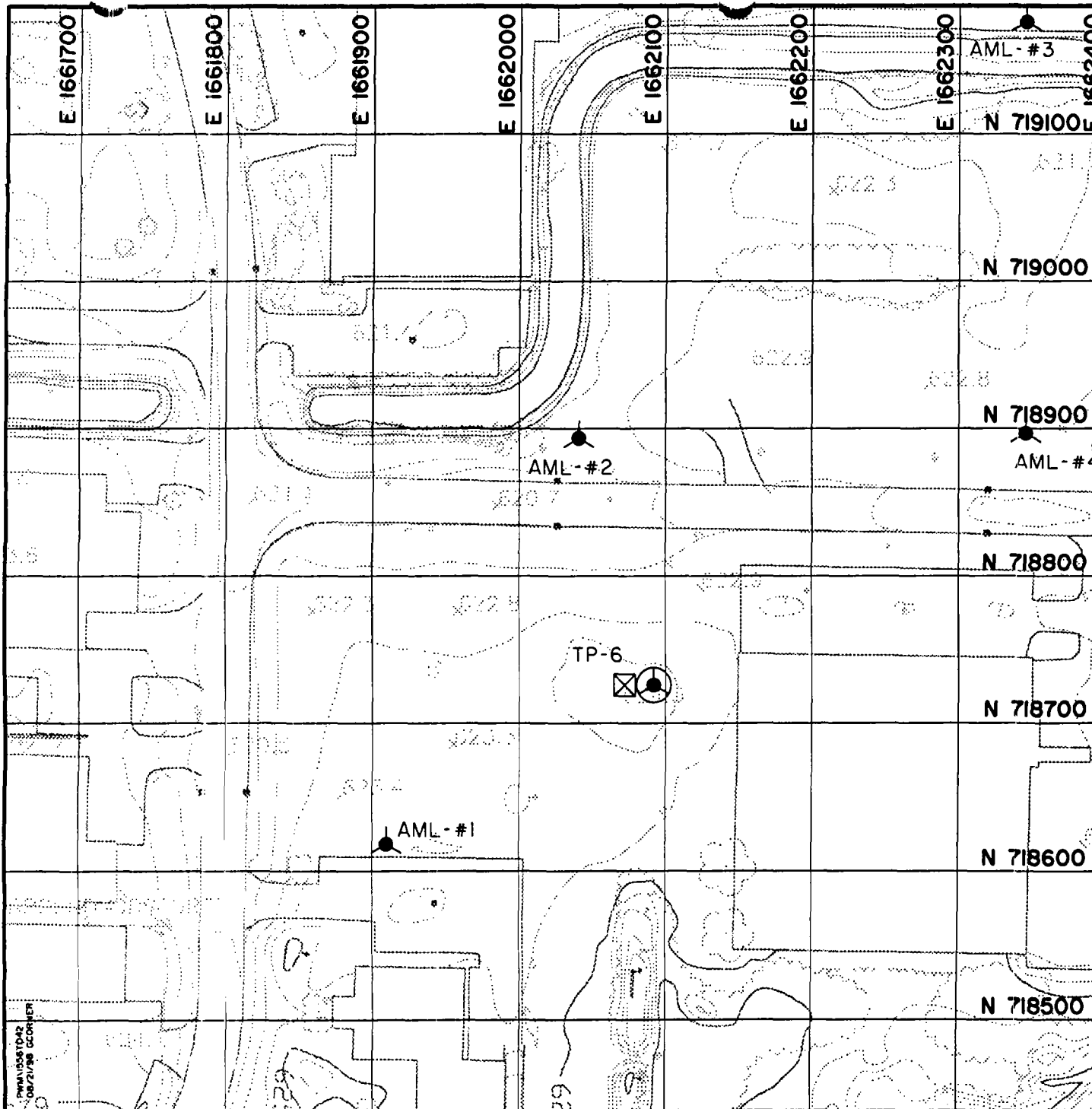
Hull & Associates, Inc.
 TOLEDO, OHIO

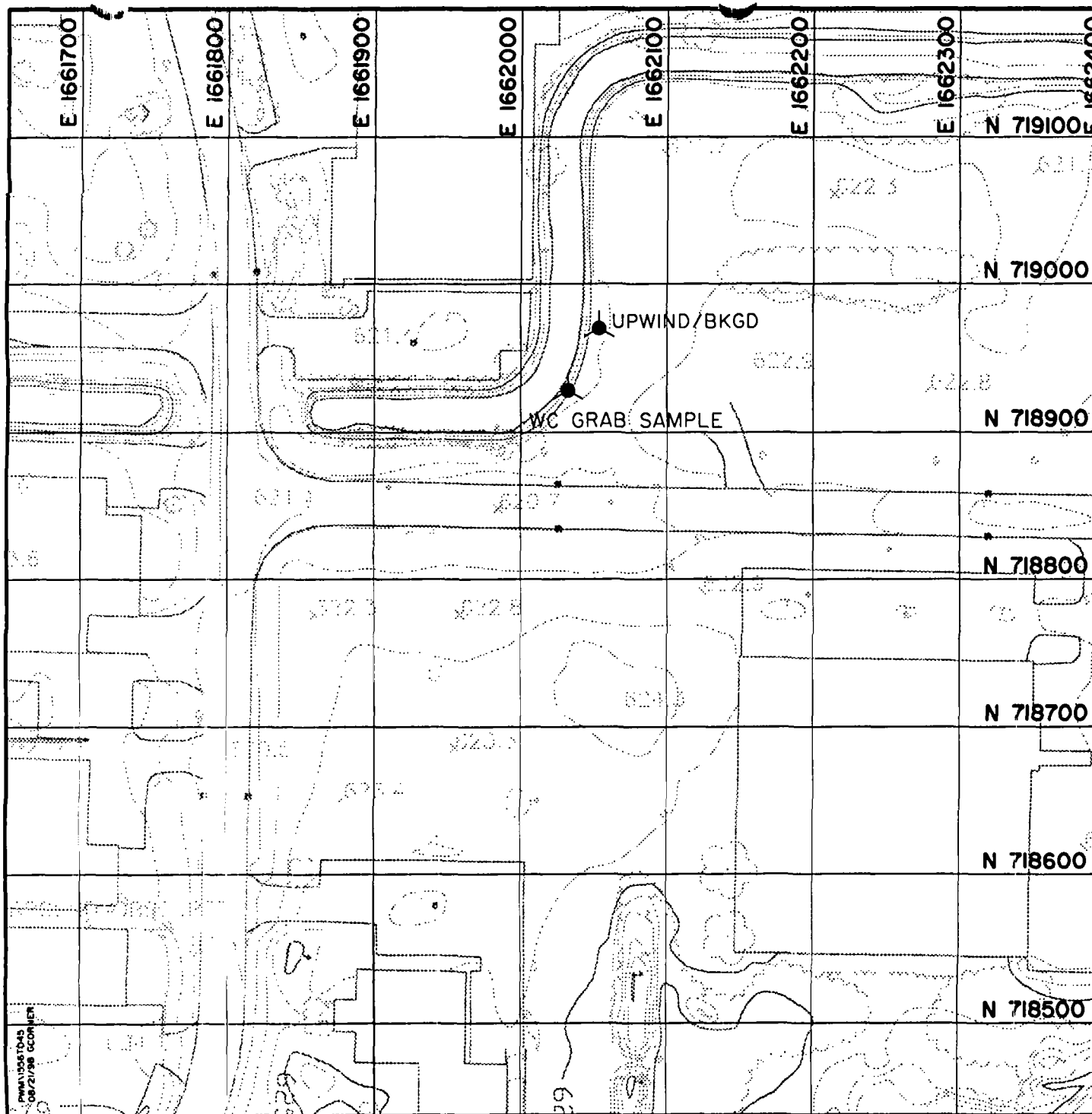
KERR-McGEE CHEMICAL, LLC.
 TOLEDO TIE TREATMENT SITE
 TIME CRITICAL REMOVAL PLAN

**BASELINE AIR
 SAMPLING LOCATIONS**
 CITY OF TOLEDO, LUCAS CO., OHIO

DATE: AUGUST 1998

PWM00





**TOLEDO TIE TREATMENT SITE
REMOVAL ACTION SCHEDULE
FIGURE 8**

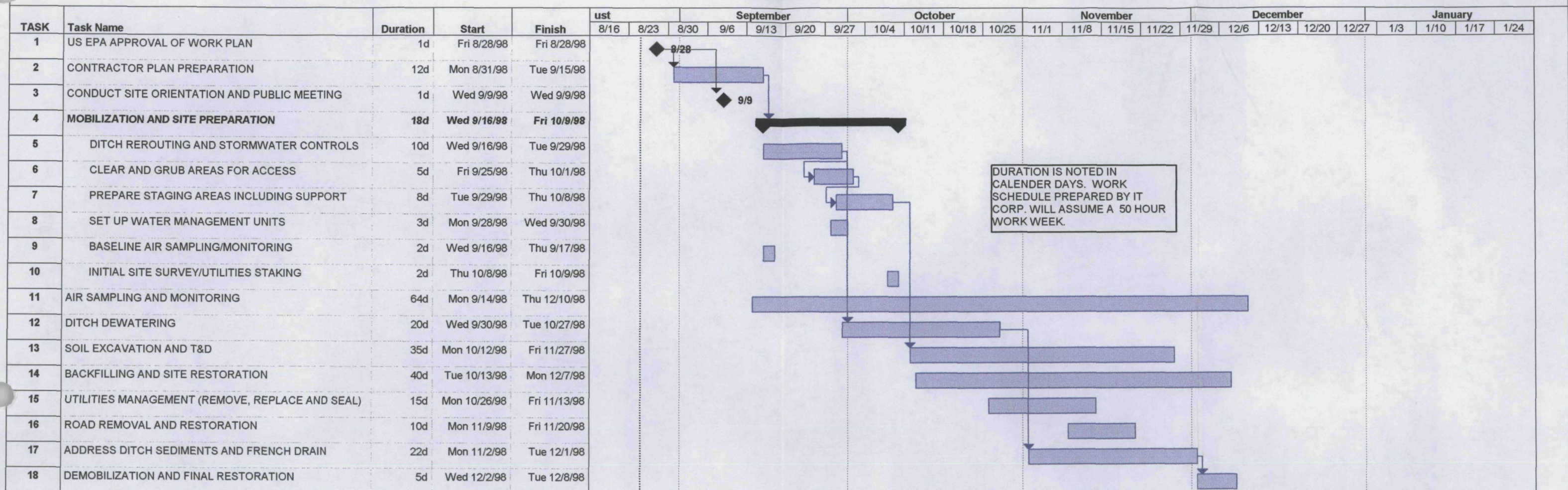


TABLE 1
SURFACE WATER SAMPLING NOTES
KERR-McGEE CHEMICAL, LLC
TOLEDO TIE TREATMENT SITE

Sample Point	Sample Time	Temperature (degrees F)	pH (S.U)	Conductance (uohms/cm)	Notes
BG1	1120	68	7.1	894	Water sample collected from ditch at a location prior to where it enters the piped (underground) section of Williams Ditch. This locality is adjacent to cultivated land directly behind a machine shop.
SW1	1430	66.9	6.79	1352	Water sample collected at resurgence of Williams Ditch, adjacent to the concrete outfall, on the downstream side of the boom dam.
SW2	1330	68.7	7.83	1920	Water sample collected at resurgence of Williams Ditch, after flowing under Arco Drive, adjacent to the concrete outfall, on the downstream side of the boom dam. The water surface at this locality has areas of strong sheen. The field blank was taken following collection of this sample and decontamination of the sampler. Field blank sampling procedures consisted of pouring lab supplied water into the dipper and then transferring the water into the sample jars.
SW3	1230	65.5	7.69	1739	Water sample was collected approximately 100 feet downstream of the last siphon dam, on the downstream side of a boom dam. Water at this location is very shallow and the sample taken was very turbid due to disturbed bottom material.
SW4	1200	67.3	7.59	1766	Water sample was collected from the ditch directly upstream of the concrete pipe that carries Williams Ditch under Hill Avenue.

NOTES

Samples were taken as close as practical to the locations shown on Figure A1 contained in Appendix A of the Removal Action Work Plan.

Decontamination procedures for the "dipper" consisted of an initialalconox and potable water wash, followed by a DI water brush and rinse, and completed with a DI water spray rinse. Decontamination fluids were containerized and emptied into the waste water tank at the end of the sampling event.

TABLE 2
SUMMARY OF ANALYTICAL RESULTS
SURFACE WATER SAMPLES
KERR-McGEE CHEMICAL, LLC
TOLEDO TIE TREATMENT SITE

Parameter	Analytical Results				
	SW-B1	SW-1	SW-2	SW-3	SW-4
VOLATILES (ug/l)					
Tetrachloroethene	<1	2J	1J	<1	<1
SEMI-VOLATILES (ug/l)					
Phenanthrene	<1	<0.9	18	2J	<0.9
Anthracene	<1	<0.9	1J	<0.9	<0.9
Fluoranthene	<1	<0.9	34	10	1J
Pyrene	<1	<0.9	24	8J	<0.9
Benzo(a)anthracene	<1	<0.9	5J	3J	<0.9
Bis(2-ethylhexyl)phthalate	<2	<0.9	<2	3J	<0.9
Chrysene	<1	<0.9	11	4J	<0.9
Benzo(b)fluoranthene	<1	<0.9	10	6J	<0.9
Benzo(k)fluoranthene	<1	<0.9	4J	2J	<0.9
Benzo(a)pyrene	<1	<0.9	5J	4J	<0.9
Indeno(1,2,3-cd)pyrene	<1	<0.9	4J	3J	<0.9
Benzo(ghi)perylene	<1	<0.9	3J	2J	<0.9
CHLORINATED HERBICIDES (ug/l)					
2,4,5-T	<0.0096	0.0236J	0.0381J	NA	NA
2,4,5-TP	<0.0096	<0.095	0.0182J	NA	NA
ORGANOCHLORINE PESTICIDES AND PCBs (ug/l)					
PCB-1260	<0.095	<0.095	0.316J	<0.095	<0.095
METALS (mg/l)					
Arsenic	<0.005	<0.005	<0.005	0.017	<0.005
Barium	0.0497J	0.0893J	0.0918J	0.32	0.0843J
Chromium	<0.0066	<0.0045	<0.0066	0.0283J	<0.0066
Copper	0.0047J	<0.0045	0.0054J	0.083	0.0052J
Lead	<0.021	<0.021	<0.021	0.093J	<0.021
Zinc	<0.009	0.0103J	0.0150J	0.537	0.0198J
Mercury	0.000099J	0.000096J	<0.000023	0.000163J	0.000088J

NA - Not Analyzed

J denotes that the concentration found is below the method detection limit and therefore can not be precisely quantified. The value indicated is a laboratory estimate.

Dinoseb was detected at concentration of 0.065J ug/l and Barium was detected at a concentration of 0.0061J mg/l in the equipment blank.

TABLE 3
SOIL SAMPLING NOTES
KERR-McGEE CHEMICAL, LLC
TOLEDO TIE TREATMENT SITE

Boring Number	CPT Equivalent	Sample Number	Depth of Sample (feet bgs)	Time Sampled	Sample Description
SB-1	BG-1	PWM001-SB1-SS3-D385	8.0-11.0	900	Sample collected @ 8 to 11 feet bgs from a saturated, loose, Brn fine SAND containing shell fragments. This unit overlies a Dk gray lacustrine clay.
SB-2	CPT-27	PWM001-SB2-SS2-D385	2.0-3.5	935	Sample collected @ 2 to 3.5 feet bgs from a slightly cohesive, Brn fine clayey SAND. This unit overlies a Dk gray lacustrine clay that contains small fine sand lenses.
SB-3	CPT-39	PWM001-SB3-SS2-D385	3.5-5.5	1025	Sample collected @ 3.5 to 5.5 feet bgs from alternating seams of Dk gray loose silt & Dk gray lacustrine clay.
SB-4	CPT-57	PWM001-SB4-SS2-D385	4.0-6.0	1105	Sample collected @ 4 to 6 feet bgs from Blk stained fine to med. SAND (4-5.5 feet) and Dk gray SILT (5.5-6.0 feet). These units demonstrated strong sheen and possessed creosote type odor and overlie a Dk gray lacustrine clay.
SB-5	CPT-4	PWM001-SB5-SS2-D385	5.0-7.0	1148	Sample collected @ 5 to 7 feet bgs from a Dk gray to Blk stained fine silty SAND that possessed a strong creosote type odor and sheen. This unit overlies a Dk gray lacustrine clay. Silt seams within the upper part of the lacustrine unit show some sheening also.
SB-6	CPT-61	PWM001-SB6-SS1-D385	6.0-8.0	1408	Sample collected @ 6 to 7.5 feet bgs from a saturated, loose, Gray fine SAND that possesses a strong creosote type odor and sheen. This unit overlies a Dk gray lacustrine clay.
SB-7	CPT-56	PWM001-SB7-SS3-D385	7.0-9.5	1536	Sample collected @ 7 to 9.5 feet bgs from a saturated, loose, Gray fine SAND containing shell fragments and possessing a strong creosote type odor and sheen. This unit overlies a Dk gray lacustrine clay.
SB-8	CPT-48	PWM001-SB8-SS2-D385	4.0-6.5	1612	Sample collected @ 4 to 6.5 feet bgs from a Blk stained Gray fine to med SAND that demonstrates a strong sheen and possesses a creosote type odor. This sand unit overlies a Dk gray lacustrine clay which contains very thin sand seams.
SB-9	CPT-16	PWM001-SB9-SS2-D385	4.5-6.0	1651	Sample collected @ 4.5 to 6 feet bgs from a Dk gray to Blk stained fine SAND and a Gray lacustrine CLAY containing fine sand and silt seams. Both the fine sand and the silt and sand seams within the upper part of the lacustrine unit possess strong creosote type odor and sheen.
SB-10	CPT-58	PWM001-SB10-SS3-D385	4.0-8.0	1725	Sample collected @ 4 to 6 feet bgs from a Blk stained Gray fine SAND that demonstrates a strong sheen and possesses a creosote type odor. Sand is saturated with free product @ 6 feet. The unit overlies a Dk gray lacustrine clay.

NOTES

This field blank was collected adjacent to SB-6 by passing laboratory supplied water through the decontaminated macro sampler.

TABLE 4
SUMMARY OF ANALYTICAL RESULTS
SOIL SAMPLES
KERR-McGEE CHEMICAL, LLC
TOLEDO TIE TREATMENT SITE

Parameter	Analytical Results									
	SB1-SS3	SB2-SS2	SB3-SS2	SB4-SS2	SB5-SS2	SB6-SS-2	SB7-SS3	SB8-SS2	SB9-SS2	SB10-SS2
sample depth (feet bgs)	9-11	2.0-3.5	3.0-5.0	4.0-6.0	5.0-7.0	6.0-8.0	7.0-9.0	4.0-6.0	4.5-6.5	4.0-6.0
CPT number	BG-1	CPT-27	CPT-39	CPT-57	CPT-4	CPT-61	CPT-56	CPT-48	CPT-16	CPT-58
VOLATILES (mg/kg wet weight as received)										
Acetone	<0.007	<0.006	<0.006	<3.2	<3.1	0.007J	<3.3	<32	<3.4	<6.5
Benzene	<0.001	<0.0009	<0.0009	7.4	1.4J	0.072	26	12	9.4	8.9
Toluene	<0.001	<0.0009	<0.0009	7.3	1.4J	0.035	110	28	16	35
Ethylbenzene	<0.001	<0.0009	<0.0009	24	4.6	0.45	100	32	9.5	21
Xylene (total)	<0.001	<0.0009	<0.0009	48	9	0.3	210	76	38	66
Styrene	<0.001	<0.0009	<0.0009	<0.45	<0.45	<0.001	<0.47	<4.6	5.4	6
SEMI-VOLATILES (mg/kg dry weight)										
2-picoline	<0.082	<0.79	<0.085	2.9J	<0.86	<0.081	<2	<2	2.2J	<2
Phenol	<0.082	<0.79	<0.085	<1.6	<0.86	<0.081	<2	<2	26	<2
2-methylphenol	<0.041	<0.4	<0.043	<0.67	<0.43	<0.04	<1	<1	19	<1
3- and 4- methylphenol	<0.082	<0.79	<0.085	4.3J	2.4J	<0.081	<2	<2	53	<2
2,4-dimethylphenol	<0.082	<0.79	<0.085	4.4J	<0.86	<0.081	4.6J	4.1	39	23
Naphthalene	<0.041	0.48J	<0.043	990	140	47	2800	1600	2200	4900
2-methylnaphthalene	<0.041	<0.4	<0.043	230	43	20	680	500	1	810J
Acenaphthylene	<0.041	18	<0.043	29	5.1	870	79	58	110	120
Acenaphthene	<0.041	1.3J	<0.043	260	38	12	400	400	230J	640J
Dibenzofuran	<0.041	.65J	<0.043	200	34	11	350	340	260J	550J
Fluorene	<0.041	2J	<0.043	250	44	14	410	420	310J	440J
Phenanthrene	<0.041	8.8	<0.043	640	100	27	1000	990	850	1800J
Anthracene	<0.041	19	<0.043	76	28	4.1	240	100	470	290J
Fluoranthene	<0.041	97	<0.043	350	57	11	470	490	440	940J
Pyrene	<0.041	95	<0.043	260	48	8.7	370	390	330J	720J
Benzo(a)anthracene	<0.041	66	<0.043	89	19	2.6	120	130	140J	260J
Bis(2-ethylhexyl)phthalate	<0.082	<0.79	<0.085	<1.6	<0.86	0.1J	<2	<2	<2.1	<2
Chrysene	<0.041	60	<0.043	74	18	2.4	120	110	120J	<2
Benzo(b)fluoranthene	<0.041	87	<0.043	68	17	2.1	98	93	120	<1
Benzo(k)fluoranthene	<0.041	30	<0.043	22	5.9	0.72	40	34	42	62
Benzo(a)pyrene	<0.041	67	<0.043	54	13	1.7	80	76	95	150
Indeno(1,2,3-cd)pyrene	<0.041	46	<0.043	25	6.7	0.95	40	38	52	79
dibenz(a,h)anthracene	<0.041	12	<0.043	6.5	1.9J	0.27J	11	11	14	20
benzo(ghi)perylene	<0.041	36	<0.043	21	5.3	0.79	33	32	40	63
ORGANOCHLORINE PESTICIDES AND PCBs (mg/kg dry weight)										
Aldrin	<0.00083	<0.0016	<0.00086	<0.0016	<0.0017	0.0055J	<0.0016	<0.0016	<0.0017	<0.0016
Beta BHC	<0.00083	0.006J	<0.00086	<0.0016	<0.0017	<0.0016	<0.0016	<0.0016	<0.0017	<0.0016
Delta BHC	<0.00083	0.0056J	<0.00086	0.0032J	0.0055J	0.0027J	0.0027J	0.0023J	0.0067J	<0.0016
DDT	<0.00016	0.032	<0.00017	0.061	0.037	<0.0016	<0.0031	<0.0032	0.056	0.144
DDE	<0.00016	<0.0031	<0.00017	<0.0031	0.0129J	<0.0031	<0.0031	<0.0032	<0.0032	<0.0031
Endosulfan I	<0.00016	<0.0016	<0.00017	<0.0016	<0.0017	<0.0016	0.0116	<0.0016	0.0096	0.0155
Endosulfan II	<0.00083	0.0042J	<0.00017	0.0051J	<0.0033	<0.0031	0.0124J	0.0043J	<0.0032	0.0076J
Endosulfan Sulfate	<0.00016	0.083	<0.00017	0.074	0.047	0.0076J	0.297	0.128	0.265	0.193
Endrin	<0.00016	0.02	<0.00017	0.0041J	0.0064J	<0.0031	0.0079J	0.0047J	0.0095J	0.0154
Endrin Aldehyde	<0.00016	0.02	<0.00017	<0.0031	<0.0033	<0.0031	<0.0031	<0.0031	<0.0032	<0.0031
Heptachlor	<0.00083	0.0037J	<0.00086	<0.0016	<0.0017	<0.0016	0.03	0.0074J	0.0261	0.0236
Heptachlor epoxide	<0.00083	<0.0016	<0.00086	<0.0016	<0.0017	<0.0016	<0.0016	0.0027J	<0.0017	<0.0016
Kapone	<0.00083	<0.016	<0.00086	<0.016	<0.017	<0.016	<0.016	0.04J	<0.017	0.144
Methoxychlor	<0.00083	<0.016	<0.00086	0.093	0.075J	<0.016	0.339	0.239	0.35	0.679
METALS (mg/kg dry weight)										
Mercury	0.0047J	0.0375J	0.0219J	0.0072J	0.0734J	0.0085J	0.0060J	0.011J	0.25	0.0253J
Barium	10.2J	48	81	14	46	9.86J	11.5J	18	62	22
Cadmium	0.24J	0.51J	1.04J	<0.23	0.64J	<0.23	<0.023	0.31J	0.88J	<0.23
Copper	5.4	11	22.6	5.3	32.2	3.8J	6.5	7	16.5	9
Chromium	4.12J	12	16.6	5.5	9.9	4.01	5.1	7.1	13.5	4.3J
Lead	<3.2	11.2J	11.2J	<3.1	53	<3.1	3.4J	4J	31	<3.1
Zinc	20	38	54	15	57	15	15	19	105	14
Arsenic	4.2	4.7	12.6	3.5	6.9	2.4	3.6	4.4	10.8	1.3
Selenium	<0.46	<0.44	<0.47	<0.44	<0.47	<0.45	<0.45	<0.45	<0.46	0.58J

TABLE 5
TEST PIT EXCAVATION NOTES
KERR-McGEE CHEMICAL, LLC
TOLEDO TIE TREATMENT SITE

Test Pit Number	Adjacent to CPT Boring	Total Depth (ft. bgs)	Depth Contaminant Encountered (ft. bgs) (1)	Notes
TP#1	CPT#40	7.6	None Observed	No staining observed or odor detected. Very little water entering the excavation. Digging terminated in gray lacustrine clay deposits.
TP#2	CPT#38	9.6	None Observed	No staining observed or odor detected. First water encountered at approximately 4 ft. bgs along an interface between two lacustrine clay deposits. A greater quantity of water encountered in a sand (?) seam at approximately 8 ft. bgs. Digging terminated in gray lacustrine clay deposits.
TP#3	CPT#35	6	None Observed	No staining observed or odor detected. First water encountered at approximately 4 ft. bgs in an approximately 6 inch thick brown fine sand seam which overlies a mottled brown/gray lacustrine clay deposit below the stained sand. Digging terminated in gray lacustrine clay deposits.
TP#4	CPT#33	5.3	2.5 to 3	Staining observed in a sand rich seam at approximately 2.5 ft. bgs. Boring terminated in lacustrine clay deposit below the stained sand.
TP#5	CPT#48	7.5	4 to 6	Water and dark colored liquid (w/strong peacock sheen) observed in a 6 inch sand seam at approximately 4 ft. bgs. Additional staining observed to approximately 6 ft. bgs. Excavation terminated in gray lacustrine clay encountered @ approximately 6.5 ft. bgs.
TP#6	CPT#56	7.5	7	Water encountered at approximately 4 ft. bgs in a gray fine sand. Strong staining and dark colored liquids displaying a strong peacock sheen were encountered at approximately 7 ft. bgs in zones where the sand coarsened. The boring was terminated at this point due to the quantity of water entering the excavation and the amount of contaminants observed.

NOTES

bgs Below ground surface
(1) Based on olfactory and visual observations

TABLE 6
SEDIMENT SAMPLING NOTES
KERR-McGEE CHEMICAL, LLC
TOLEDO TIE TREATMENT SITE

Sediment Sample Number	Depth of Sample (feet bgs)	Date Sampled	Time Sampled	Sample Description
SED-BG	0-1.2	5/15/98	1355	Drove sampler and recovered 1.2 feet
SED-001	1.5-2.0	5/15/98	1015	Drove sampler and recovered approximately 2.5 feet. Sed Profile: 0 to 1.5 organic material; 1.5 to 2.0 silt; 2.0 to 2.5 clay/silt. No fluorescence detected.
SED-002	1-1.5	5/15/98	852	Drove sampler and recovered approximately 2.5 feet. Sed Profile: 0 to 1 organic material; 1.0 to 1.5 sand and silt; 1.5 to 2.5 clay/silt. No fluorescence detected.
SED-003	1-1.75	5/15/98	730	Drove sampler and recovered approximately 2.0 feet. Sed Profile: organic rich zone followed by sand followed by clay. Sand zone sampled. No fluorescence detected.
SED-004	0-1.2	5/14/98	1835	Drove sampler and recovered 1.2 feet. Sed Profile: 1.2 feet of silt containing free product with clay in the very tip of the sampler.
SED-005	0-1.8	5/14/98	1300	Entire sample consisted of fine sand and silt held in suspension by Free Product.
SED-006	0.5-1	5/14/98	930	Base of ditch contained large gravel that required several attempts to bypass. Sed. Sample recovery approximately 1.2 ft. Sed Profile: 0 to 0.75 ft dark black organic rich loose sand and silt possessing a strong odor and sheen; 0.75 to 1.0 ft silt with strong odor and sheen (0 to 1 ft strong fluorescence); 1 to 1.2 very soft gray silt and clay.
SED-007	2.5-3.5	5/14/98	825	Drove sampler approximately 3.8 feet - 3.6 feet recovered. Sed Profile: 0 to 1.5 very loose black silt and fine sand possessing a strong sheen and odor; 1.5 to 3.6 very soft gray silt and clay (strong fluorescence).
SED-008	1.75-3.0	5/13/98	1820	Drove sampler approximately 4.0 feet - 3.3 feet recovered. Sed Profile: 0 to 2.5 ft dark black organic rich silt with some sand, strong sheen and some odor; 2.5 to 3.0 ft dark gray fine sand (strong fluorescence); 3.0 to 3.3 ft clay.
SED-009	2.5-3.1	5/13/98	1602	Drove sampler approximately 3.9 feet - 3.5 feet recovered. Sed Profile: 0 to 2.8 ft organic rich material; 2.8 to 3.0 ft dark gray fine sand (strong fluorescence); 3.0 to 3.3 ft clay.
SED-010	1.1-1.6	5/13/98	1215	Drove sampler approximately 3.5 feet - 2.1 feet recovered. Sed Profile: 0 to 1.6 ft organic rich silt; 1.6 to 2.1 ft fine sand with little silt. No fluorescence detected.
SED-011	1.3-2.6	5/13/98	950	Drove sampler approximately 3.6 feet - 2.7 feet recovered. Sed Profile: 0 to 1.3 ft organic rich silt; 1.3 to 2.6 ft fine sand with little silt containing a thin organic rich seam @ 1.6 ft.; 2.6 to 2.7 ft soft dark gray clay with black staining. No fluorescence detected.
SED-012	0.8-1.6	5/13/98	830	Drove sampler approximately 3.5 feet - 1.7 feet recovered. Sed Profile: 0 to 0.6 ft organic rich silt; 0.6 to 1.5 ft laminated silt and sand; 1.5 to 1.7 ft soft gray clay. Sample collected from the laminated fine sand and silt based on fluorescence.
SED-013	0.9-1.2	5/12/98	1705	Drove sampler approximately 3.8 feet - 2.8 feet recovered. Sample collected from a gray clayey sand seam dividing a dark black organic rich seam. (FID response: 61.9 ppm - no response in adjacent sediments)

NOTES

The field blank was collected adjacent to SED-004 by passing laboratory supplied water through the decontaminated sediment sampler.

TABLE 7
SUMMARY OF ANALYTICAL RESULTS
SEDIMENT SAMPLES
KERR-McGEE CHEMICAL, LLC
TOLEDO TIE TREATMENT SITE

Parameter	Analytical Results (mg/kg)													
	SED-BG	SED-001	SED-002	SED-003	SED-004	SED-005	SED-006	SED-007	SED-008	SED-009	SED-010	SED-011	SED-012	SED-013
VOLATILES														
Xylene	<0.001	<0.002	<0.002	0.007J	180	910	29	3.1	3.1	0.010J	0.016	<0.002	<0.002	0.036J
Acetone	<0.009	0.021J	<0.011	0.033J	<27	<15	<5.7	<1.4	<1.8	0.045J	0.039J	<0.011	0.013J	<0.077
Ethylbenzene	<0.001	<0.002	<0.002	<0.002	78	410	11	1.7	1.8	<0.003	<0.002	<0.002	<0.002	<0.011
Toluene	<0.001	<0.002	<0.002	<0.002	<3.8	380	1.4J	<0.19	<0.26	<0.003	<0.002	<0.002	<0.002	<0.011
Benzene	<0.001	<0.002	<0.002	<0.002	<3.8	77	<0.82	<0.19	<0.26	<0.003	<0.002	<0.002	<0.002	<0.011
Vinyl acetate	<0.004	<0.006	<0.005	<0.007	40	<6.6	<2.5	<0.58	<0.77	<0.008	<0.006	<0.005	<0.005	<0.033
SEMI-VOLATILES														
3- and 4-methylphenol	<0.089	<0.14	<0.11	<0.14	<5.1	78J	<0.87	<1	<1.4	<1.7	<0.67	<0.1	<0.52	<2.9
Acetophenone	<0.044	<0.071	<0.053	<0.071	<2.5	16J	<0.44	<0.52	<0.68	<0.87	<0.34	<0.05	<0.26	<1.5
2,4-dimethylphenol	<0.089	<0.14	<0.11	<0.14	<5.1	95J	<0.87	<1	<1.4	<1.7	<0.67	<0.1	<0.52	<2.9
Naphthalene	<0.044	0.100J	0.096J	0.080J	1900	45000	800	220	820	<0.87	0.390J	0.080J	<0.26	<1.5
2-methylnaphthalene	<0.044	0.081J	0.085J	0.1	900	11000	230	52	290	0.980J	<0.34	<0.05	<0.26	<1.5
Acenaphthylene	<0.044	0.120J	0.320J	0.24J	38	850	9.4	2.9J	16	17	2.6J	0.73	2J	13J
Acenaphthene	<0.044	0.290J	0.470J	0.400J	680	8800	200	53	310	28	1.8J	0.99	2.9	28
Dibenzofuran	<0.044	0.210J	0.490J	0.330J	570	7000	150	45	240	22	1.2J	1.1	2.2J	25
Fluorene	<0.044	0.440J	1.1	0.680J	800	8900	200	70	340	52	2.3J	2.6	5.1	57
N-nitrosodiphenylamine	<0.044	0.330J	0.330J	0.400J	<2.5	<15	<0.44	<0.52	<0.68	<0.87	<0.34	<0.05	<0.26	<1.5
Phenanthrene	0.150J	3.8	5.4	4	1800	21000	460	150	860	320	9.8	9.9	25	230
Anthracene	<0.044	0.86	0.86	0.59J	220	3100	47	19	79	38	3.7	2	4.9	38
Fluoranthene	0.260J	6.7	8.3	6.2	1000	11000	250	78	570	460	33	14	61	350
Pyrene	0.240J	6.6	6.7	5.8	750	8200	190	51	430	360	28	11	46J	260
Butyl benzyl phthalate	<0.089	2.3	0.180J	0.420J	<5.1	<29	<0.87	<1	<1.4	<1.7	<0.67	<0.1	<0.58	<2.9
Benzo(a)anthracene	0.110J	2.7	2.2	1.9	250	2700	64	20	150	130	13	3.9	15	95
Bis(2-ethylhexyl) phthalate	0.110J	2.2	0.76	1.4	5.3	<29	<0.870	<1	1.4J	2.3J	1.7J	0.440J	0.640J	<2.9
Chrysene	0.140J	3.7	2.4	2.8	210	2200	43	16	130J	130	16	4.2	15	93
Di-n-octyl phthalate	<0.089	0.16	<0.11	<0.14	<5.1	<29	<0.87	<1	<1.4	<1.7	<0.67	<0.1	<0.52	<2.9
Benzo(b)fluoranthene	0.190J	4.4	2.4	3.5	190	1700	40	15	130J	130	17	4.7	14	88
Benzo(k)fluoranthene	0.071J	1.5	0.84	1.1	66	610	13	4.5J	35	41	6.2	1.7	4.7	32
Benzo(a)pyrene	0.130J	3	1.5	2.1	150	1400	32	11	71	75	11	3	9.6	59
Indeno(1,2,3-cd)pyrene	0.110J	2.7	1.1	1.9	80	690	16	5.6	38	44	7.5	2.1	5.5	33
Dibenz(a,h)anthracene	<0.044	0.55J	0.280J	0.430J	22	180	4.1J	1.6J	10	11	2J	0.54	1.5J	9.1J
Benzo(ghi)perylene	0.099J	2.3	0.91	1.7	65	570	13	4.4J	31	36	6.2	1.7	4.4	26

Concentrations of all chemicals were non-detect in equipment and trip blanks submitted with these samples.

TABLE 7 (cont.)
SUMMARY OF ANALYTICAL RESULTS
SEDIMENT SAMPLES
KERR-McGEE CHEMICAL, LLC
TOLEDO TIE TREATMENT SITE

Parameter	Analytical Results (mg/kg dry weight)													
	SED-BG	SED-001	SED-002	SED-003	SED-004	SED-005	SED-006	SED-007	SED-008	SED-009	SED-010	SED-011	SED-012	SED-013
CHLORINATED HERBICIDES														
Dinoseb	<0.0023	0.199J	<0.0027	0.086J	<0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-TP (Silvex)	<0.00044	0.148	<0.00053	<0.014	0.045J	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-T	<0.00044	0.071J	0.0028	0.088	0.093J	NA	NA	NA	NA	NA	NA	NA	NA	NA
ORGANOCHLORINE PESTICIDES AND PCBs														
Aldrin	<0.00089	<0.0029	<0.0021	<0.0029	<0.041	<0.024	<0.018	0.005J	<0.0028	<0.0035	<0.0027	<0.002	<0.0021	<0.0029
Alpha BHC	<0.00089	<0.0029	<0.0021	<0.0029	<0.041	<0.024	<0.018	<0.0021	0.0087J	<0.0035	<0.0027	<0.002	<0.0021	0.0054J
Delta BHC	<0.00089	<0.0029	<0.0021	<0.0029	0.075J	0.057J	0.042J	0.0063J	0.0121J	<0.0035	<0.0027	<0.002	<0.0021	0.0116J
Chlordane	0.170J	<0.14	<0.11	<0.14	<2.0	<1.2	<0.86	<0.1	<0.140	<0.17	<0.13	<0.099	<0.1	<0.14
DDT	0.0758	0.22	0.037	0.099	<0.079	0.79	0.042J	0.0126J	0.112	0.128	0.089	0.0185J	0.0195J	0.101
DDE	0.271	1	0.216	0.584	0.344J	0.33	<0.034	0.0053J	0.207	0.262	0.333	0.045	0.025	0.163
DDD	0.248	1.03	0.214	0.452	0.222J	<0.046	<0.034	0.0094J	0.147	0.245	0.3	0.029	0.033	0.347
Dieldrin	0.0064J	0.08	<0.0041	<0.0057	<0.079	<0.046	<0.034	0.0094J	<0.0053	0.0078J	0.0055J	0.0082J	<0.0041	<0.0057
Endosulfan II	<0.00089	<0.0056	<0.0041	<0.0057	<0.079	0.091J	<0.034	<0.004	0.0074J	<0.0068	<0.0053	<0.0039	<0.0041	0.0059J
Endosulfan Sulfate	<0.0017	<0.0056	0.015J	<0.0057	0.5	2.84	0.28	0.038	0.153	0.071	0.0137J	<0.0039	0.0146J	0.115
Endrin	<0.0017	<0.0056	<0.0041	<0.0057	<0.079	0.124J	<0.034	<0.004	<0.0053	<0.0068	<0.0053	<0.0039	<0.0041	0.0141
Endrin Aldehyde	<0.0017	<0.0056	<0.0041	<0.0057	0.296J	<0.046	<0.034	<0.004	<0.0053	<0.0068	<0.0053	<0.0039	<0.0041	<0.0037
Methoxychlor	<0.0089	<0.029	<0.021	<0.140	<2.0	3.8	<0.180	<0.021	0.31	0.21	<0.027	<0.020	<0.021	0.19
HEAVY METALS														
Mercury	0.0653J	0.0931J	0.0244J	0.125J	0.127J	0.0664J	0.0155J	0.0536J	0.0836J	0.113J	0.094J	0.0441J	0.0347J	0.0983J
Barium	26	126	67	127	160	54	44	78	124	140	91	44	44	79
Cadmium	<0.25	2.89J	1.15	2.91J	3.41J	0.93J	<0.25	0.46J	1.49J	3.53J	3.2J	0.65J	0.86J	2.09J
Chromium	5.9	28.8	14.2	28.6	32	10.5	12.6	17.4	23.2	35	24.4	13.1	11	26.8
Copper	7.8	60.6	21.6	49.6	66	18.1	11.1	22.9	35.3	50	41.3	16.4	16.4	36.3
Silver	<0.59	<0.94	<0.70	<1	<1.3	<0.77	<0.58	<0.68	<0.90	<1.2	<0.89	<0.66	<0.69	1.9
Zinc	34	297	112	264	408	102	39	65	210	405	272	89	83	207
Lead	11.1	162	65	133	165	50	10.7	16	125	202	117	52	69	183
Arsenic	1.9	13.2	6.8	13.2	15.8	10.7	4.8	7.5	15.1	22.1	15.2	7.6	7.7	14
Selenium	<0.49	<0.79	<0.59	<0.80	<1.1	1.84J	<0.48	<0.57	<0.76	<1	<0.75	<0.56	<0.58	<0.81

NA - Not Analyzed

Concentrations of all chemicals were non-detect in equipment and trip blanks submitted with these samples.

J denotes that the concentration found is below the method detection limit and therefore can not be precisely quantified. The value indicated is a laboratory estimate.

TABLE 8

**SUMMARY OF ANALYTICAL RESULTS
WORST CASE AIR SAMPLE
KERR-MCGEE CHEMICAL, LLC
TOLEDO TIE TREATMENT SITE**

Parameter	Analytical Results (ppbv)		
	PWM001- WCAIR- 081398- T388	PWM001- WCBKG 081398- T388	Lab Blank
Compounds Detected By EPA Method TO-14			
Chloromethane	<5.6	0.86	<0.5
Bromomethane	<5.6	0.84B	0.92
Freon 11	<5.6	0.89	<0.5
1,1-dichloroethene	<5.6	1.6	<0.5
Benzene	500	0.95	<0.5
Toluene	1500	3	<0.5
Ethylbenzene	780	1.2	<0.5
m,p-Xylene	1200	5.1	<0.5
o-Xylene	380	1.2	<0.5
1,3,5-Trimethylbenzene	130	<0.70	<0.5
1,2,4-Trimethylbenzene	240	0.71	<0.5
Acetone	<22	9.3	<2
4 - ethyltoluene	210	<2.8	<2
Tentatively Identified Compounds			
1-methylethyl benzene	72	ND	ND
1-ethyl-2-methyl-benzene	35	ND	ND
unkown aromatic	47	ND	ND
Benzofuran	120	ND	ND
1-ethyl-3-methyl-benzene	39	ND	ND
2,3-dihydro-1H-indene	850	ND	ND
1-propynyl-benzene	140	ND	ND
Naphthalene	1200	ND	ND
2-methylnaphthalene	120	ND	ND
1-methylnaphthalene	54	ND	ND
Pentane	ND	12	ND

ND - Not Detected

All field samples collected on 08/13/98

Predominant Wind Direction - North/Northeast

Temperature - ~ 82 °F

APPENDIX A

Overall Site Map

APPENDIX B

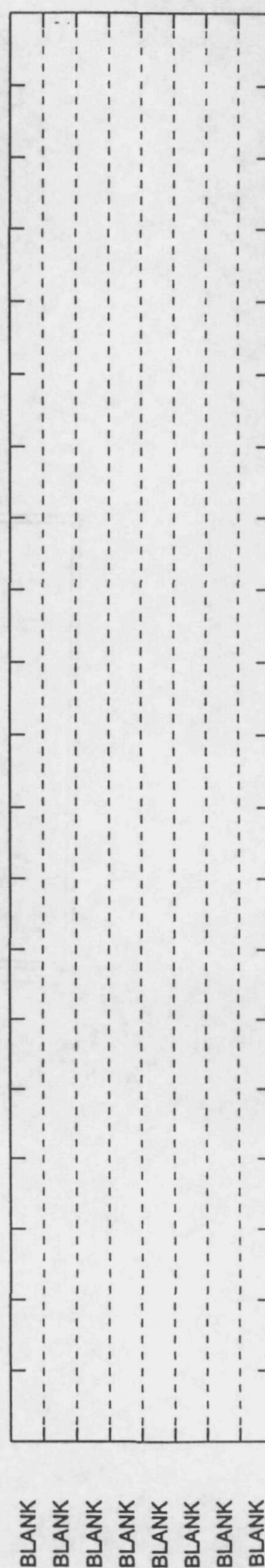
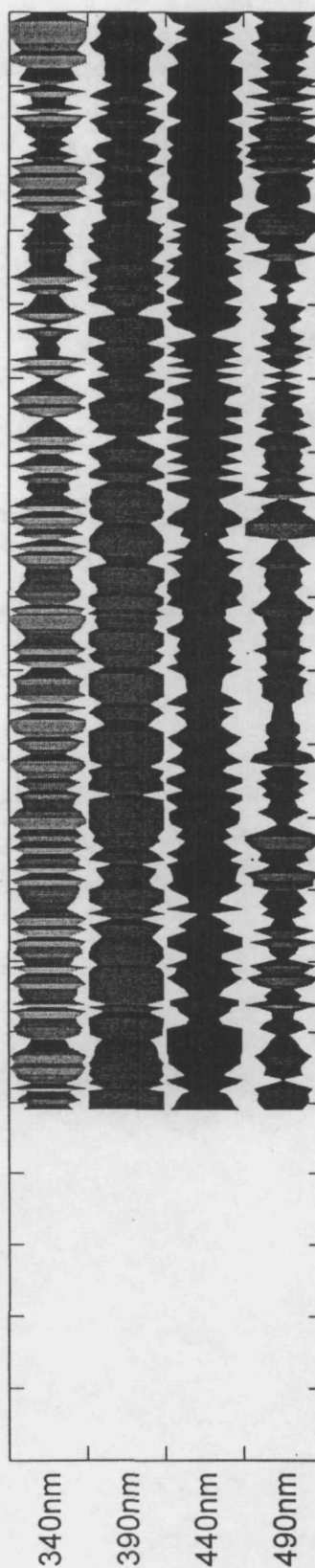
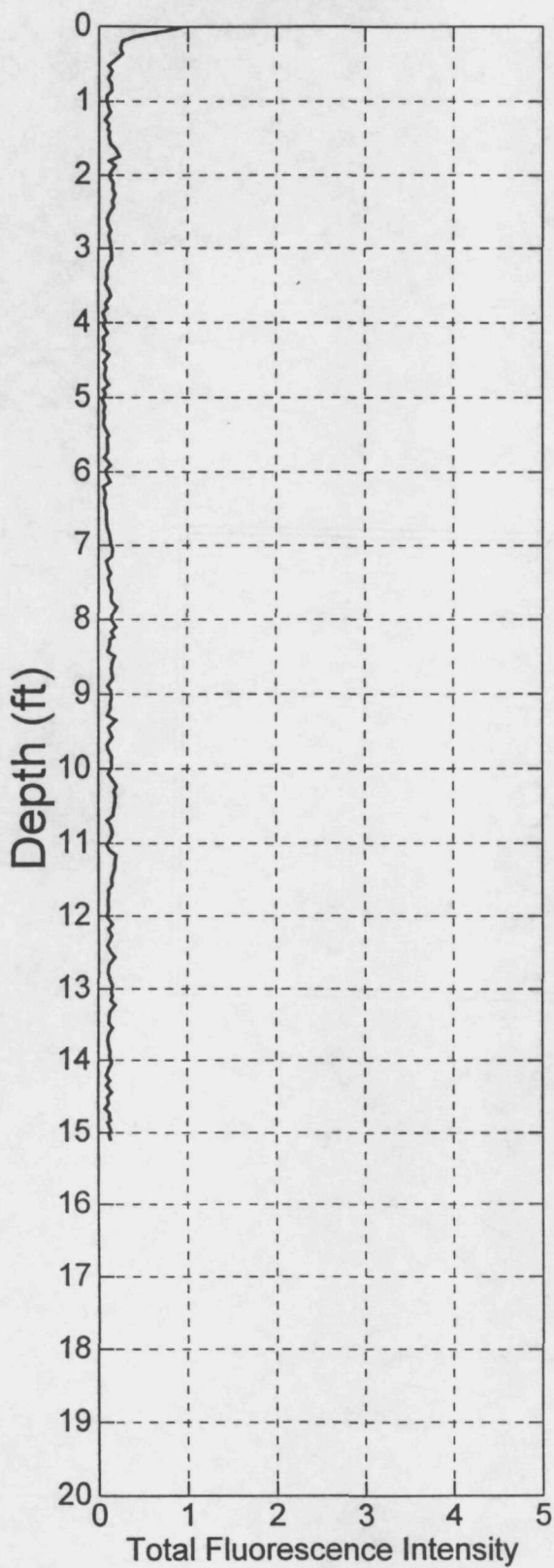
ROST™ Logs And LIF Signature Thickness Map

ROST™
LOGS

CPT01

Measured LIF End Depth
15.09 ft
Measured Peak Fluorescence
0.8542%

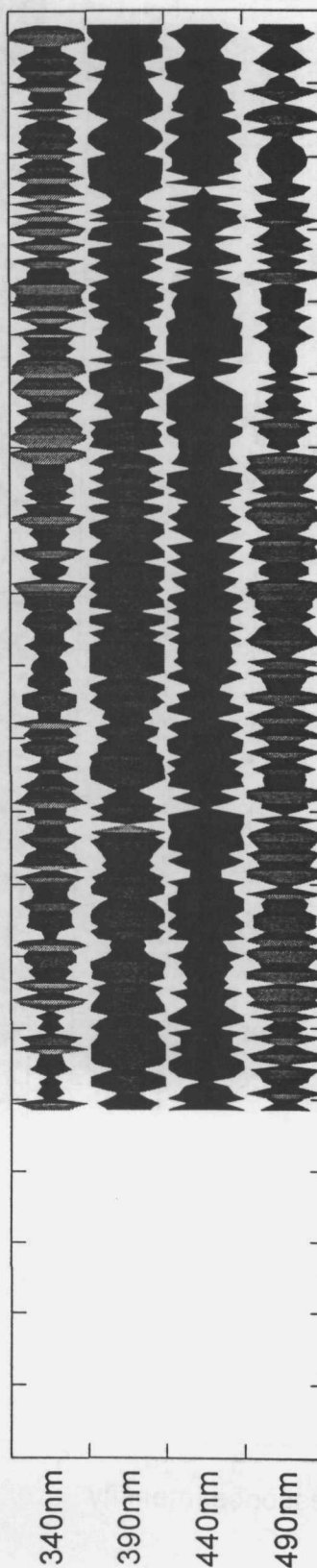
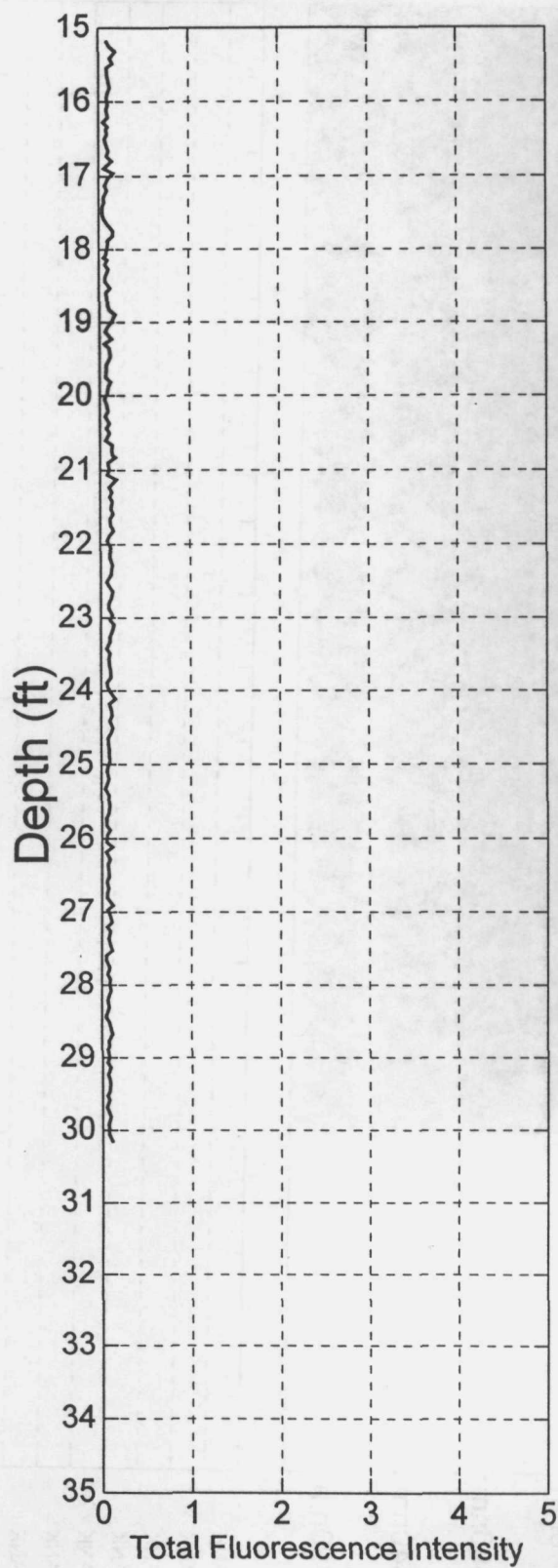
Job#: 0301-8077
Acquisition Date: 04-27-1998



CPT01A

Measured LIF End Depth
30.15 ft
Measured Peak Fluorescence
0.1878%

Job#: 0301-8077
Acquisition Date: 04-27-1998



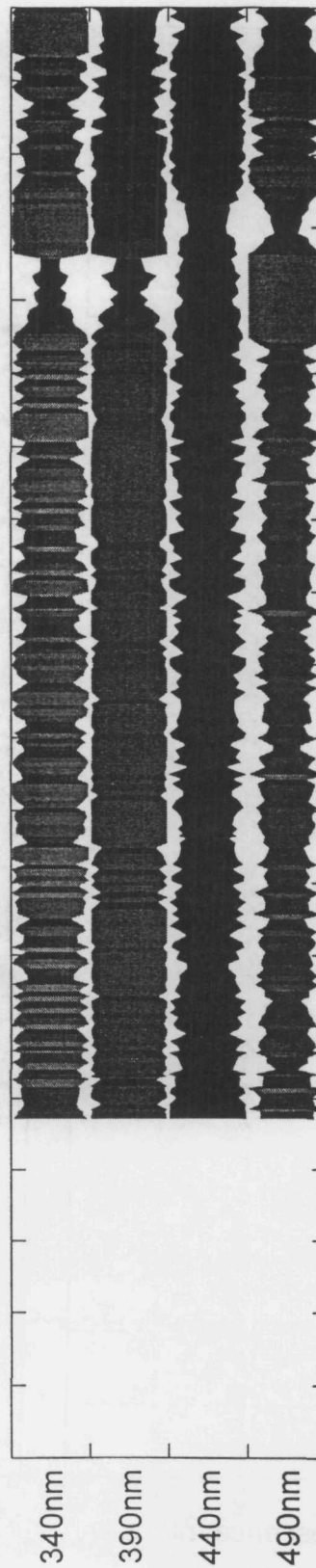
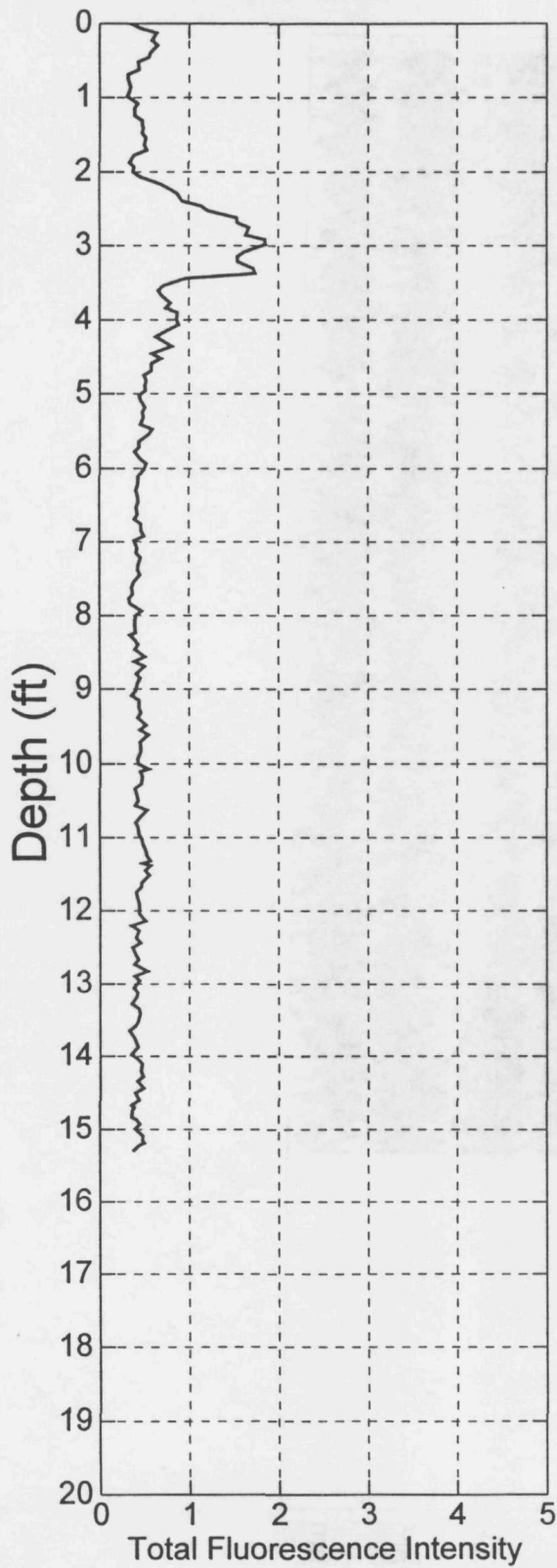
Job#: 0301-8077

15.29 ft

Measured Peak Fluorescence
1.853%

Acquisition Date: 04-27-1998

CPT02

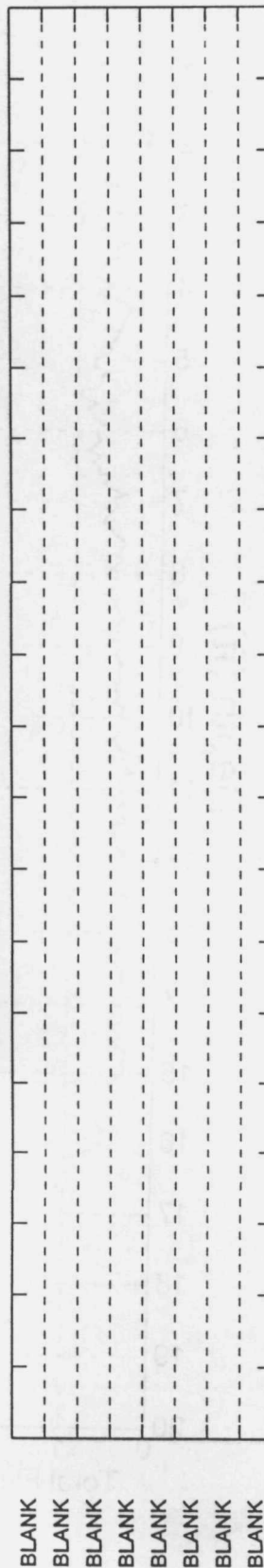
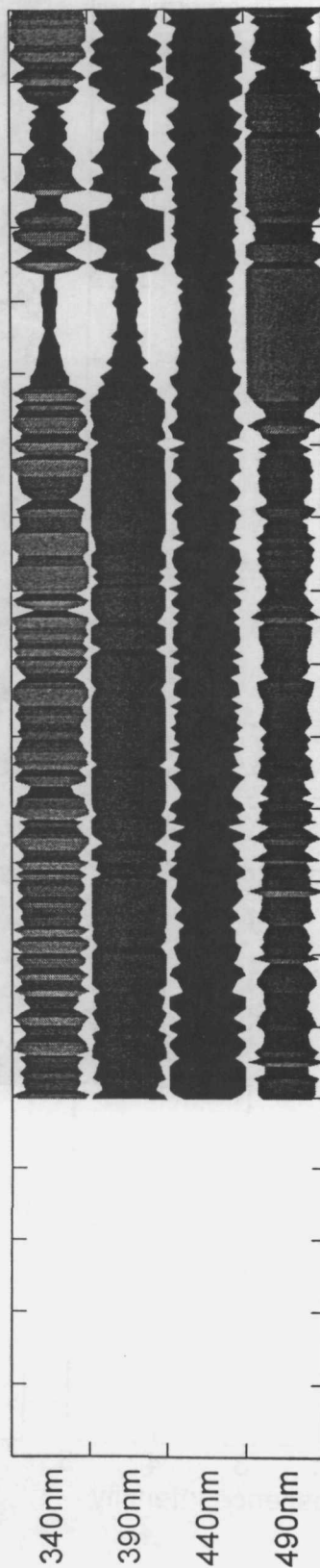
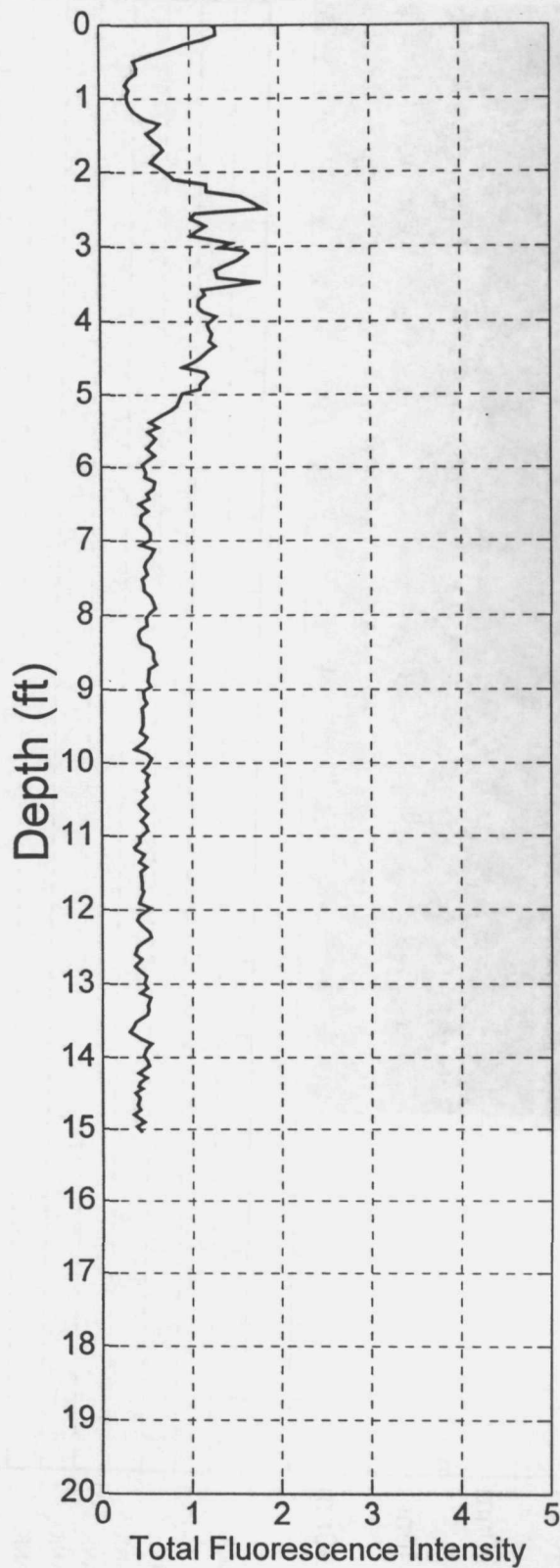


BLANK
BLANK
BLANK
BLANK
BLANK
BLANK
BLANK
BLANK

CPT03

Measured LIF End Depth
15.03 ft
Measured Peak Fluorescence
1.821%

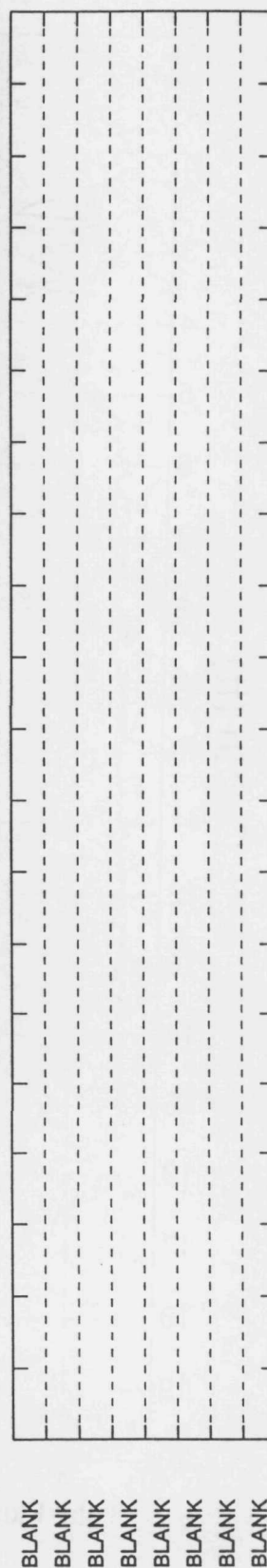
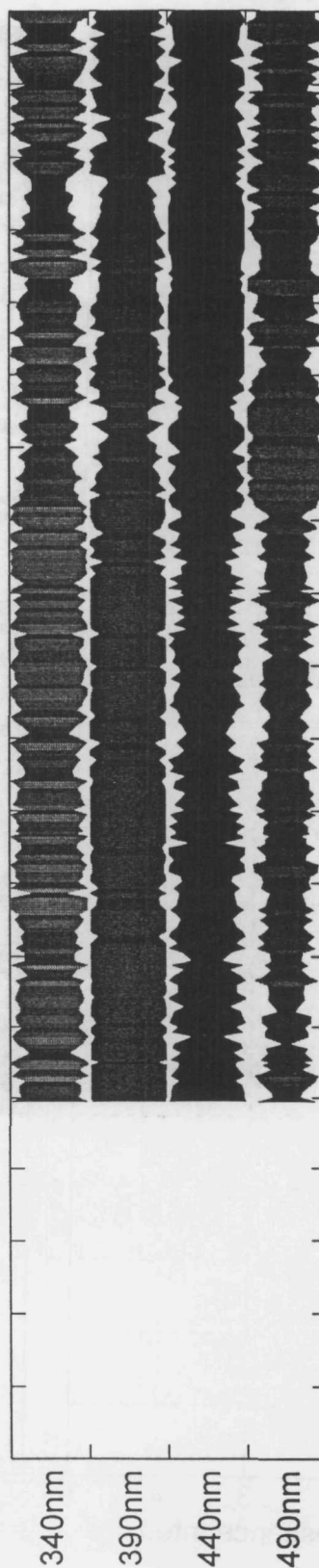
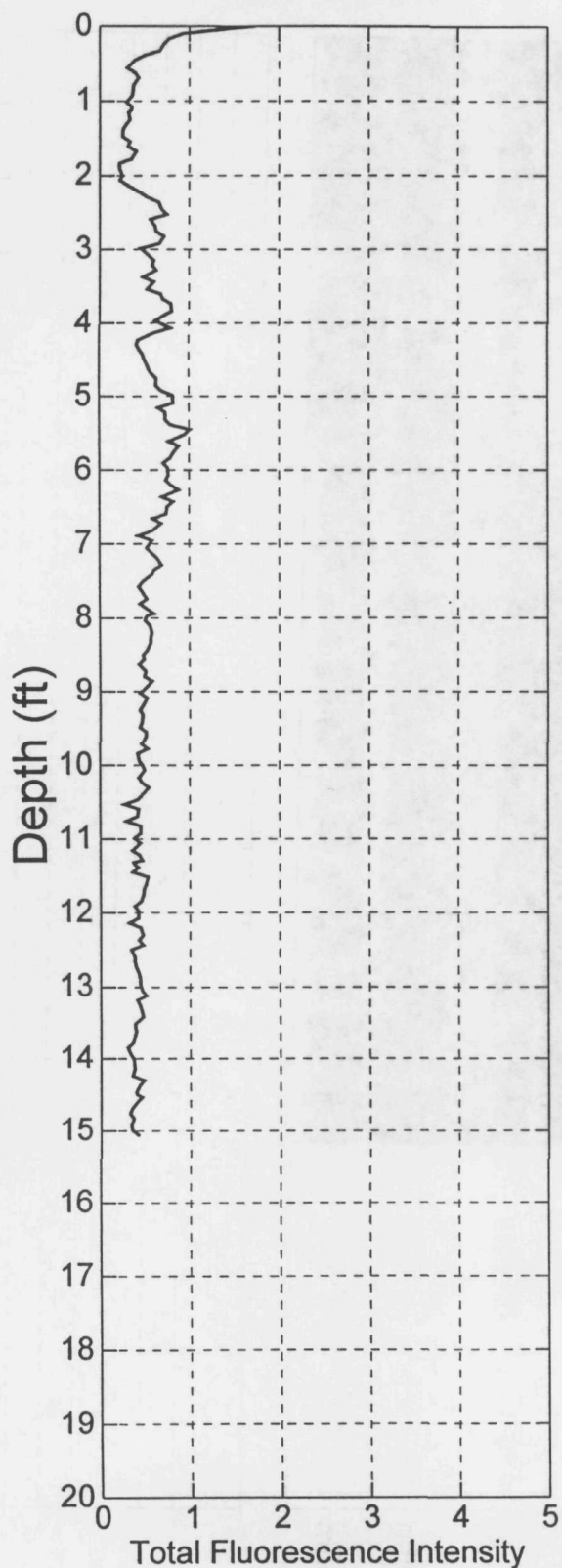
Job#: 0301-8077
Acquisition Date: 04-27-1998



CPT04

Measured LIF End Depth
15.06 ft
Measured Peak Fluorescence
1.007%

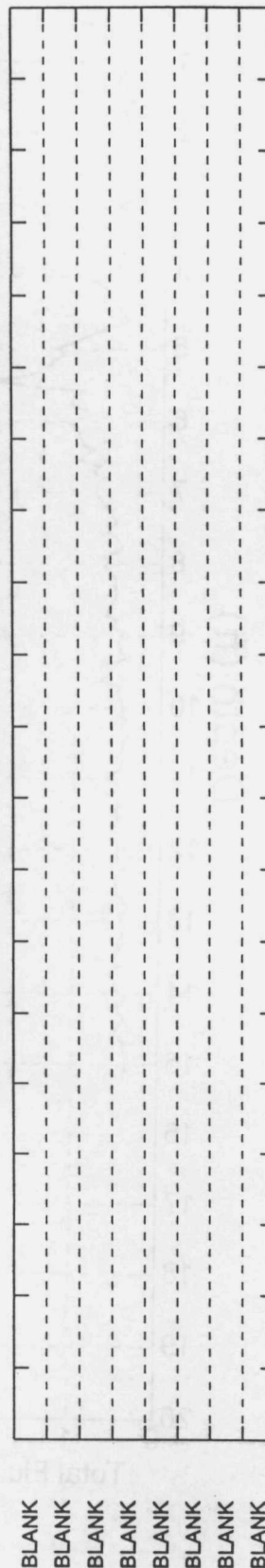
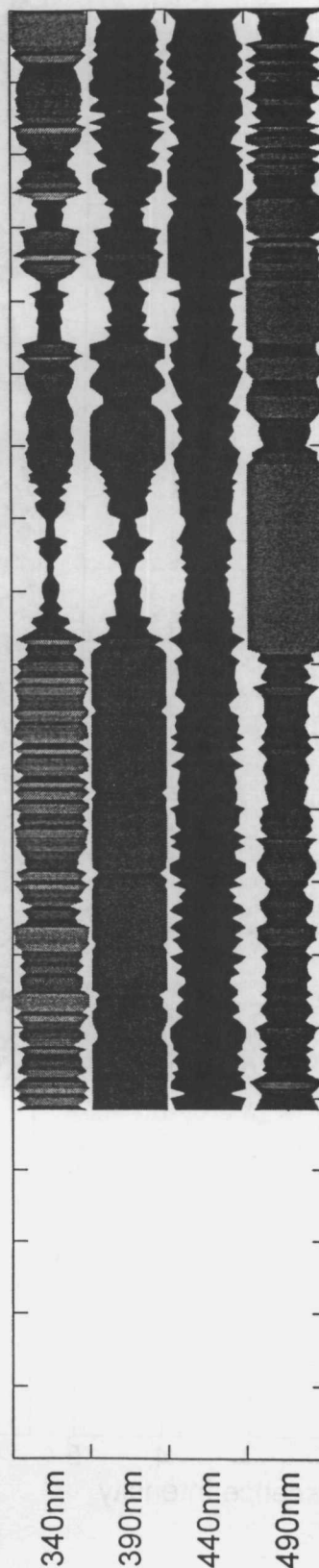
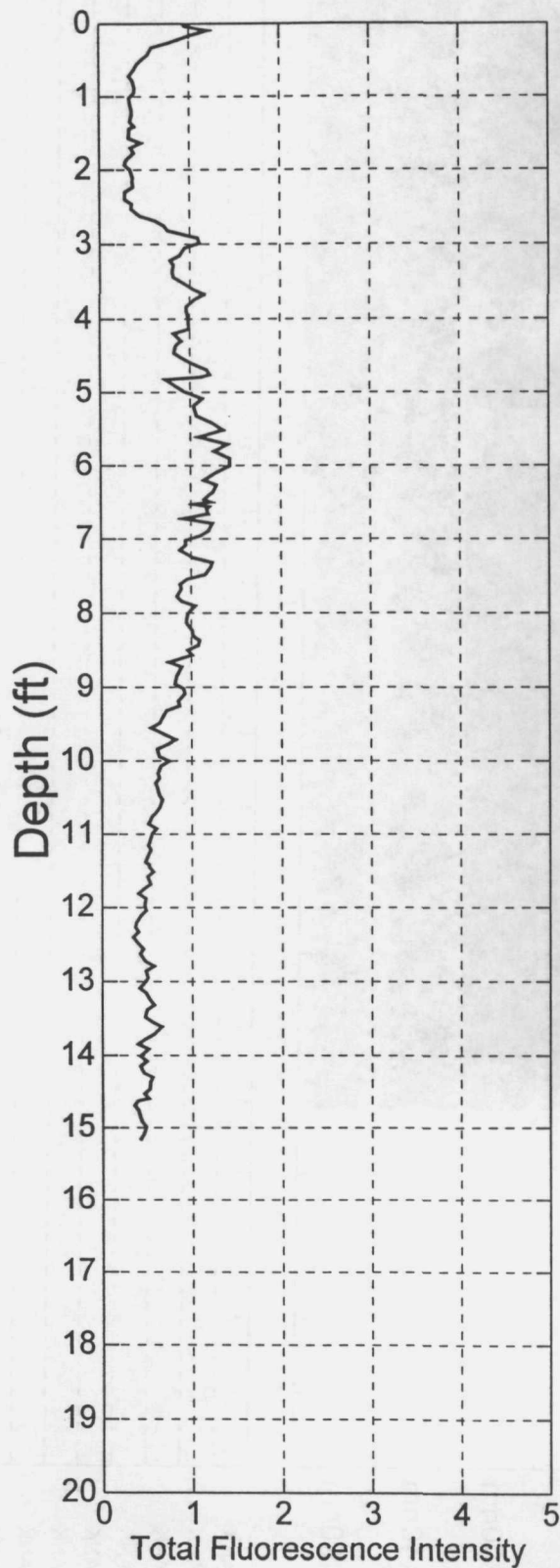
Job#: 0301-8077
Acquisition Date: 04-27-1998



CPT05

Measured LIF End Depth
15.16 ft
Measured Peak Fluorescence
1.429%

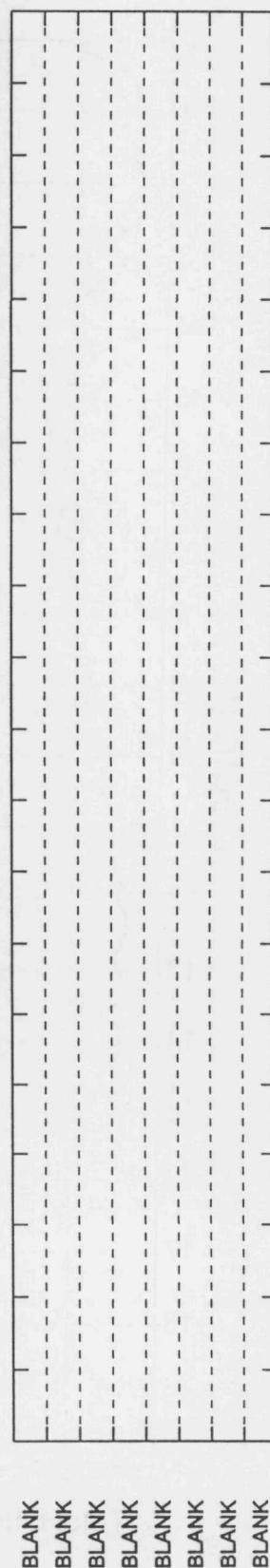
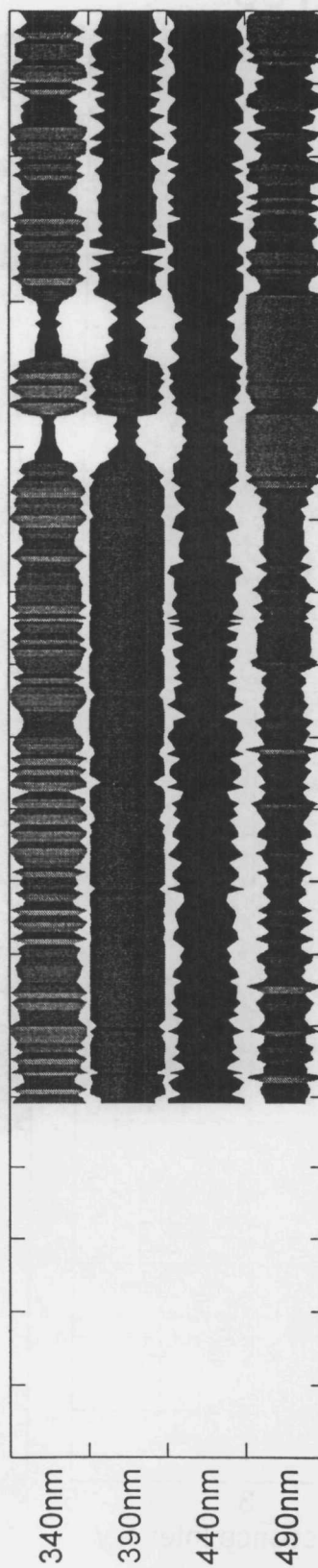
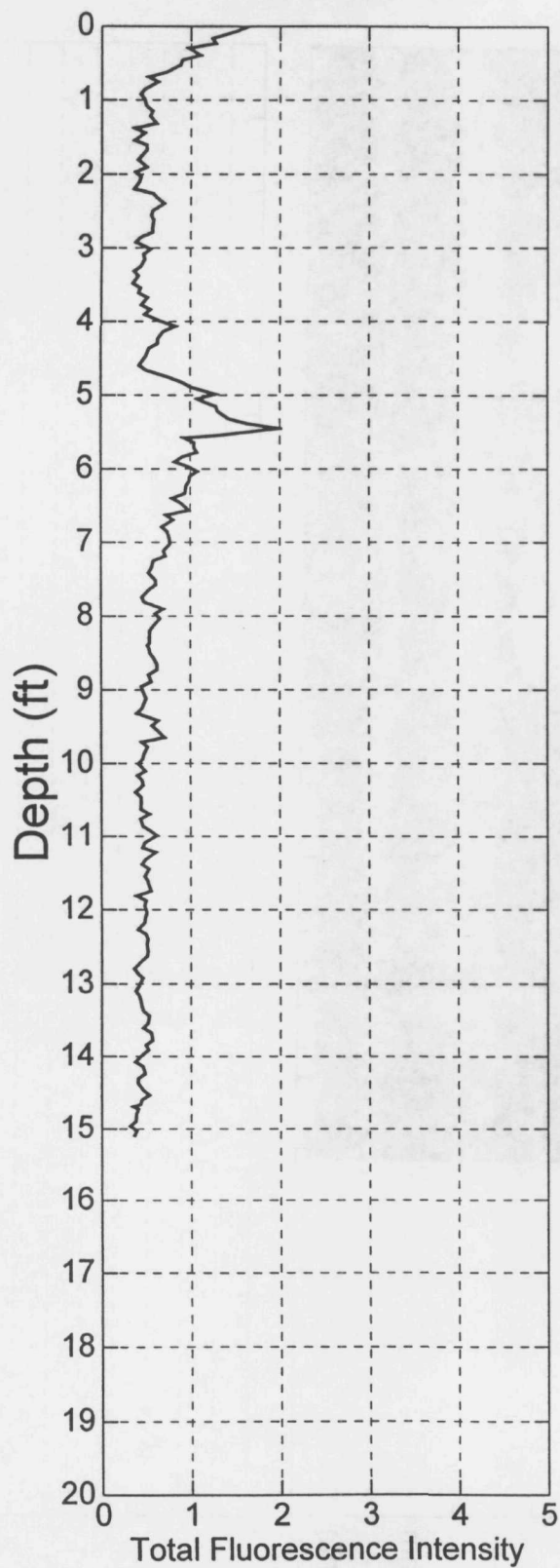
Job#: 0301-8077
Acquisition Date: 04-27-1998



CPT06

Measured LIF End Depth
15.09 ft
Measured Peak Fluorescence
1.985%

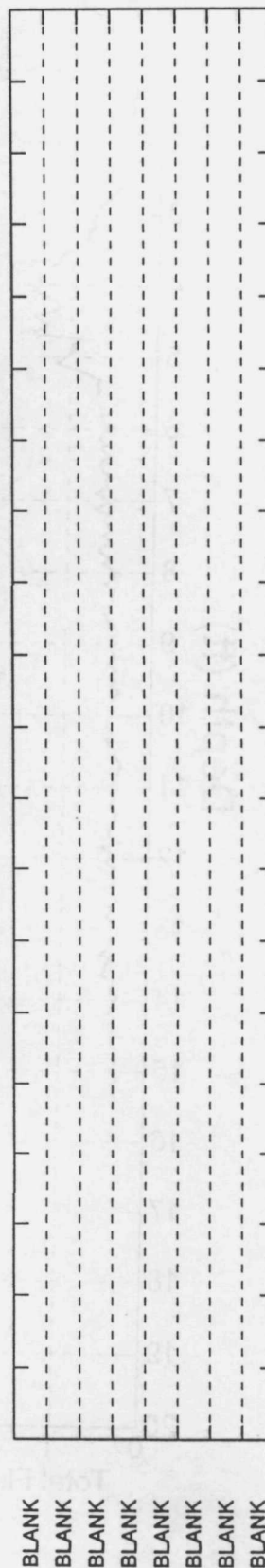
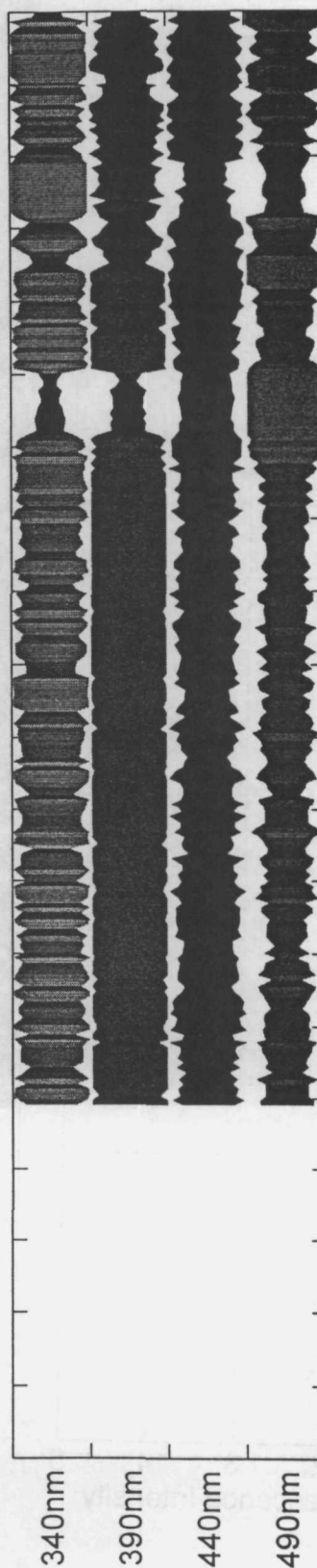
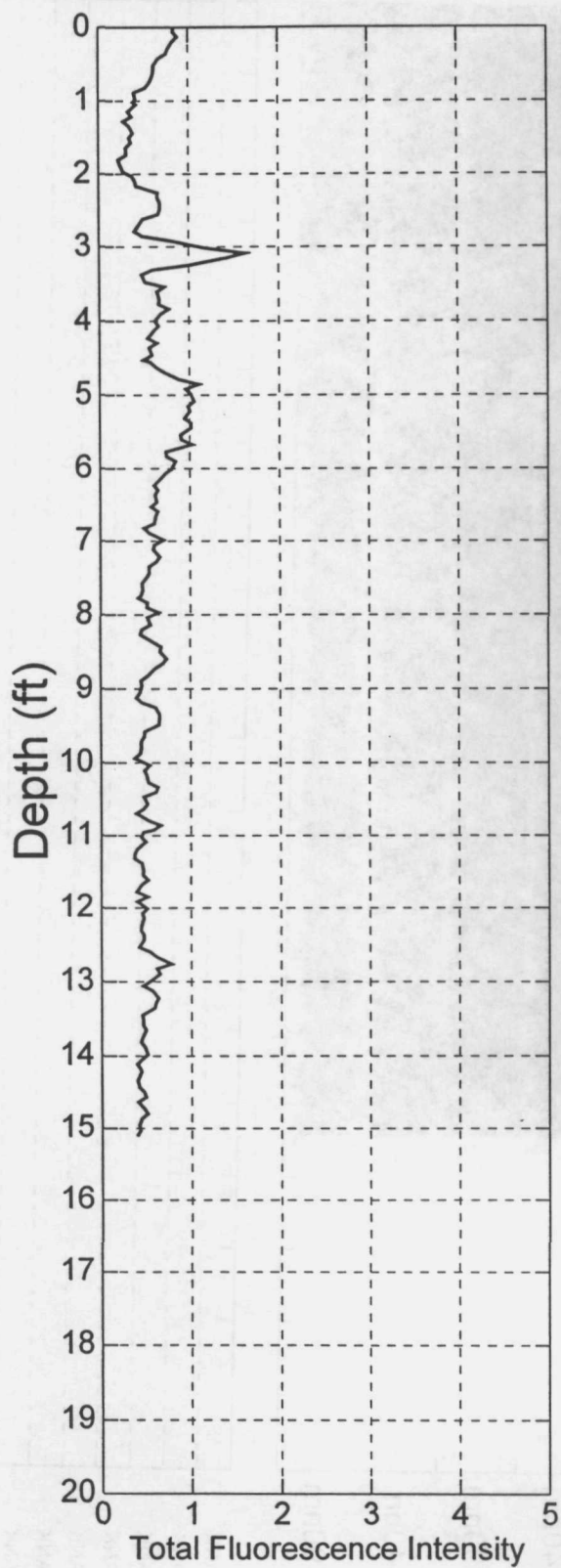
Job#: 0301-8077
Acquisition Date: 04-27-1998



CPT07

Measured LIF End Depth
15.09 ft
Measured Peak Fluorescence
1.623%

Job#: 0301-8077
Acquisition Date: 04-27-1998



CPT08

Measured LIF End Depth

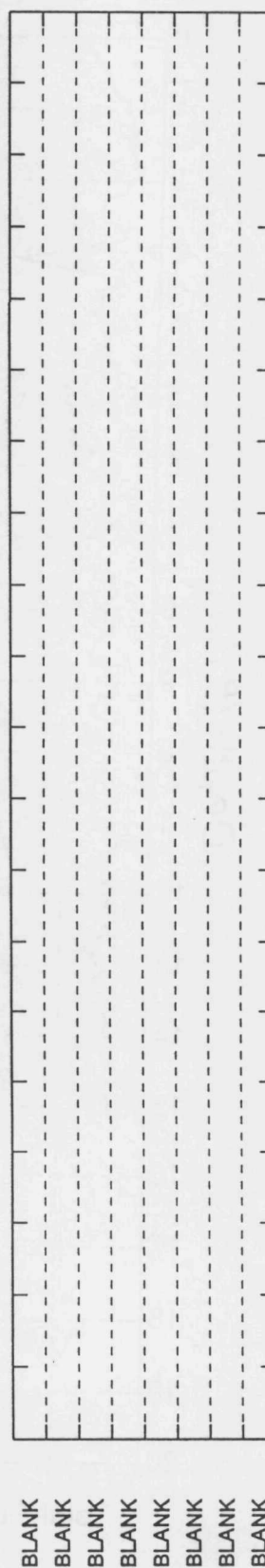
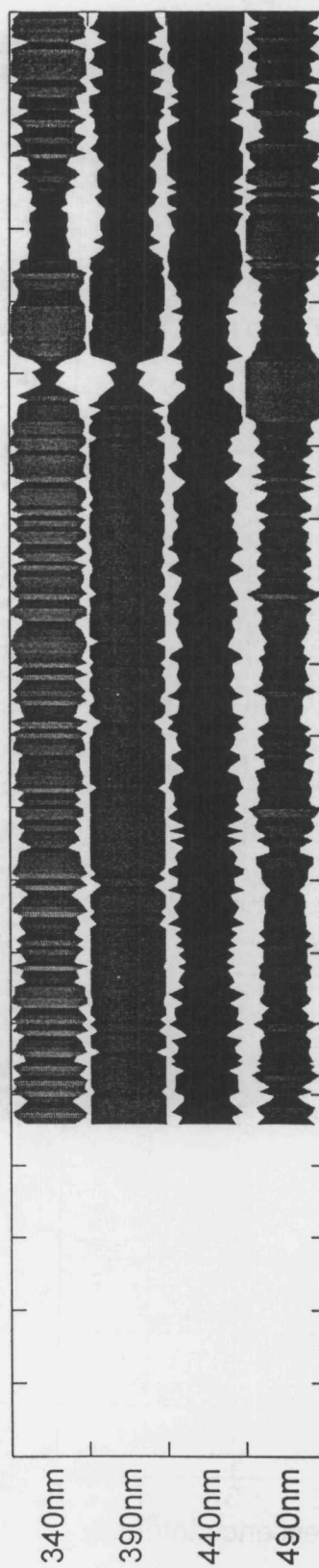
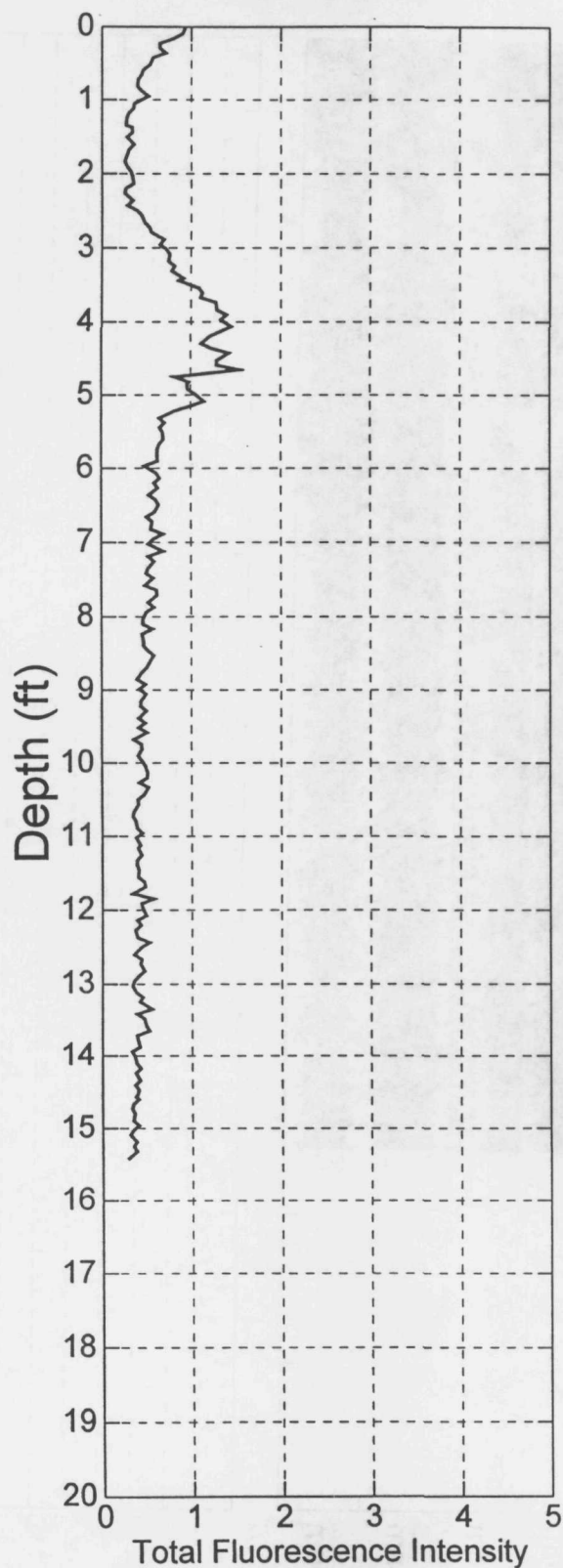
15.42 ft

Measured Peak Fluorescence

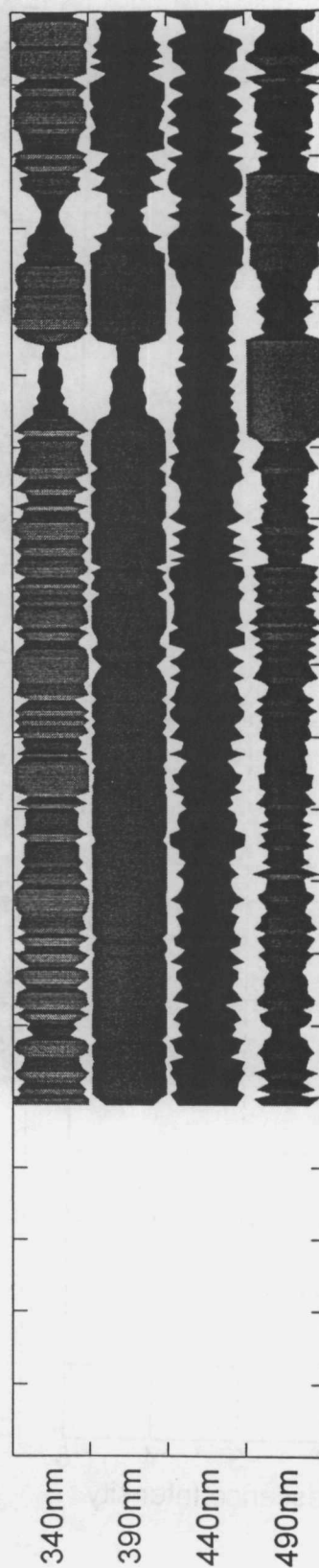
1.537%

Job#: 0301-8077

Acquisition Date: 04-27-1998



Job#: 0301-8077
Acquisition Date: 04-27-1998



BLANK
BLANK
BLANK
BLANK
BLANK
BLANK
BLANK
BLANK

CPT10

Measured LIF End Depth

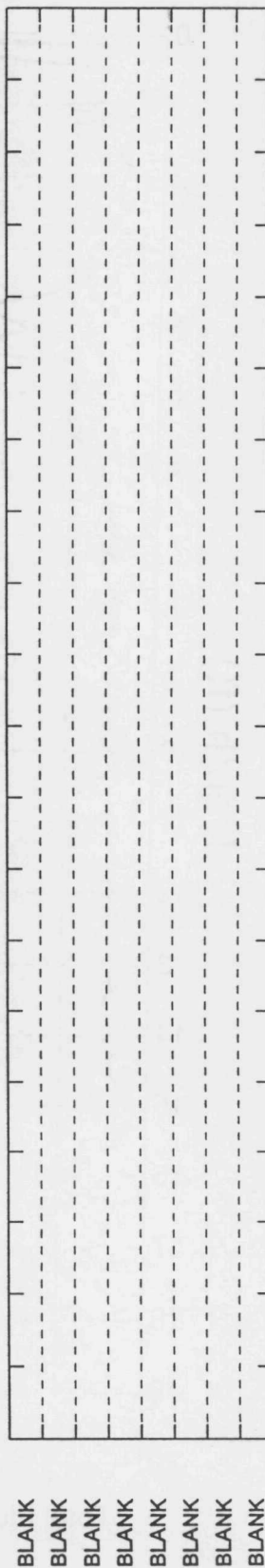
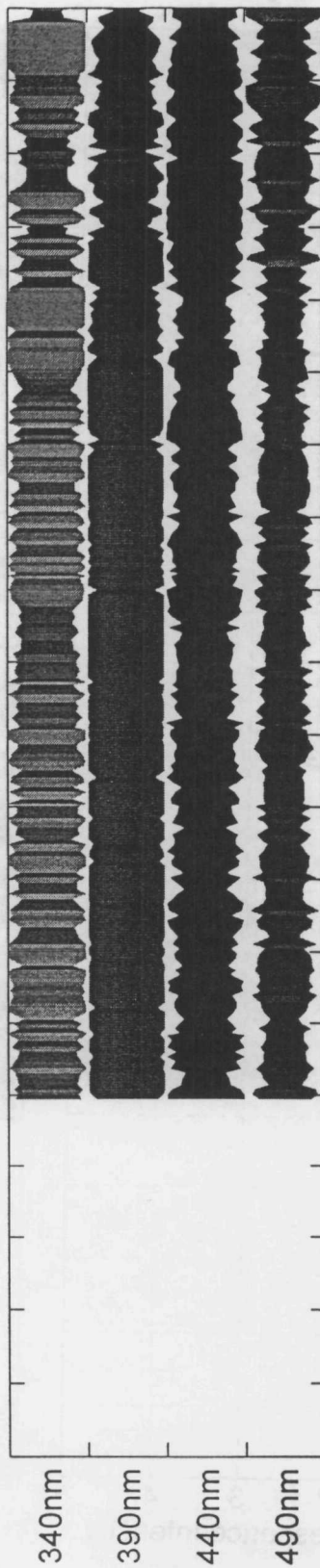
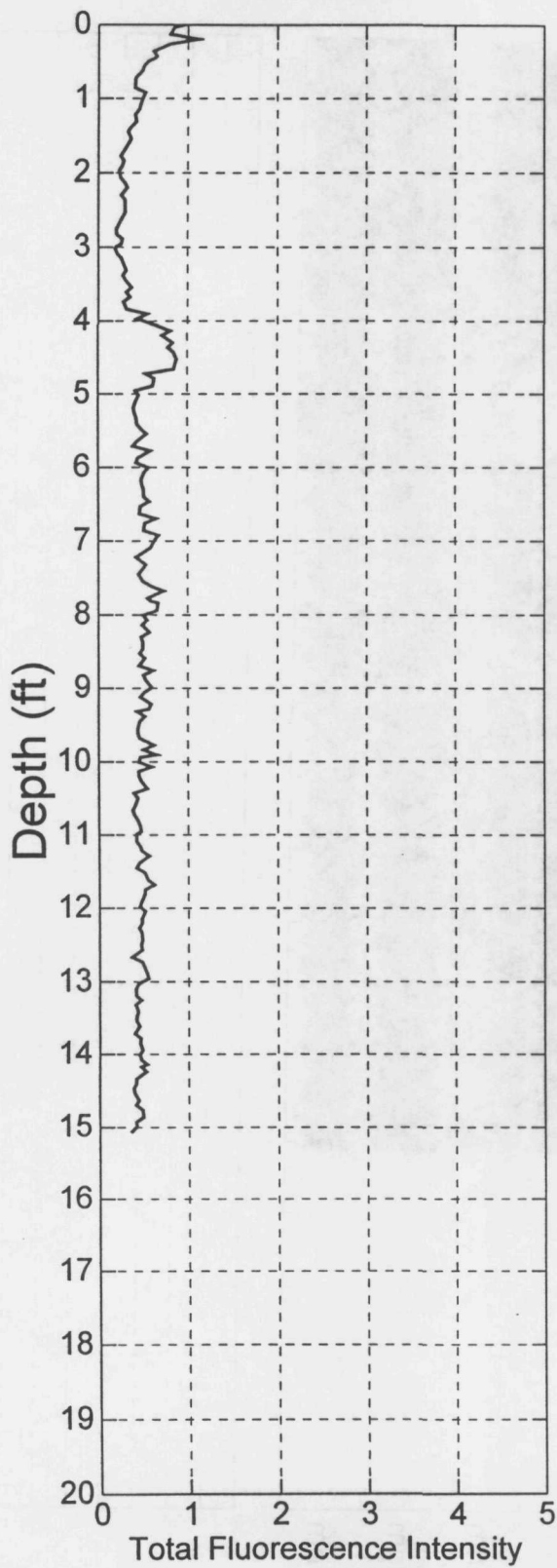
15.06 ft

Measured Peak Fluorescence

1.111%

Job#: 0301-8077

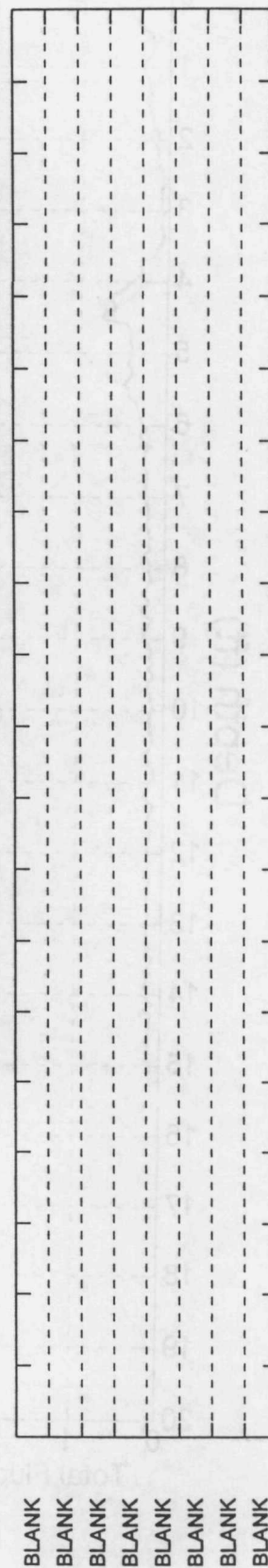
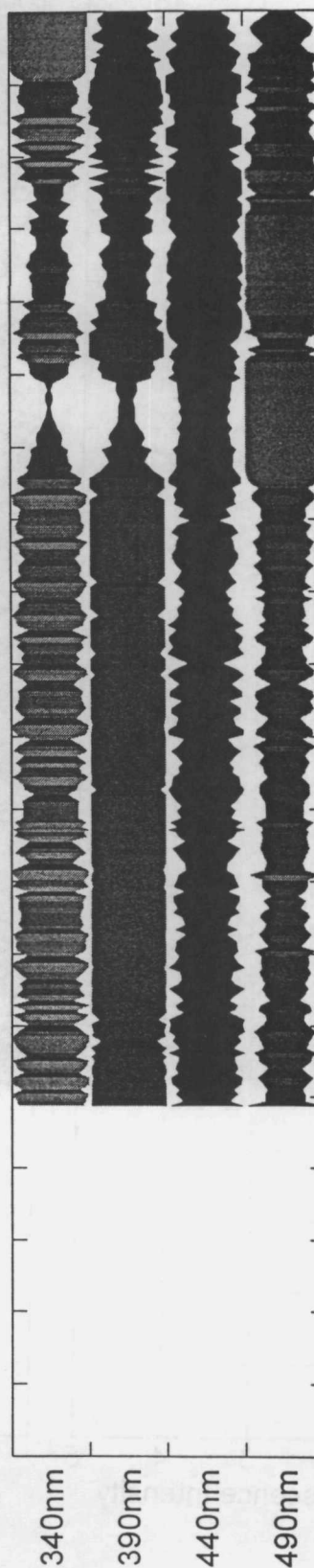
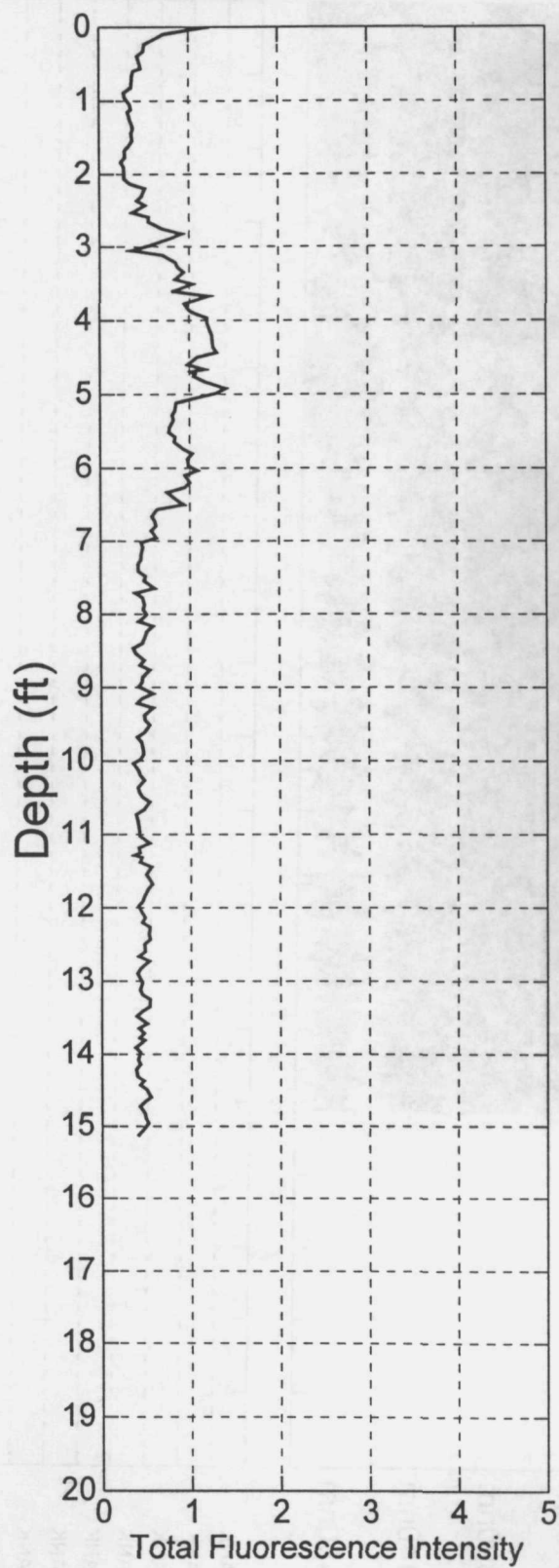
Acquisition Date: 04-27-1998



CPT11

Measured LIF End Depth
15.12 ft
Measured Peak Fluorescence
1.403%

Job#: 0301-8077
Acquisition Date: 04-27-1998



CPT12

Measured LIF End Depth

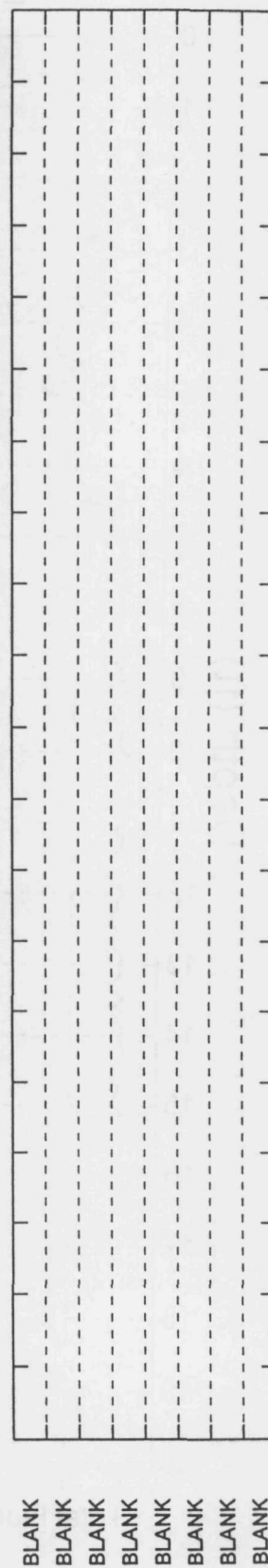
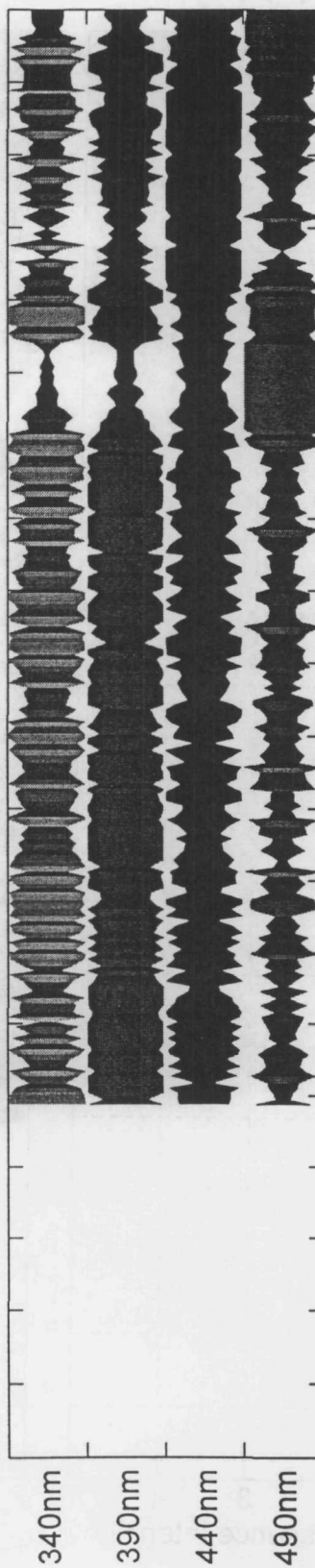
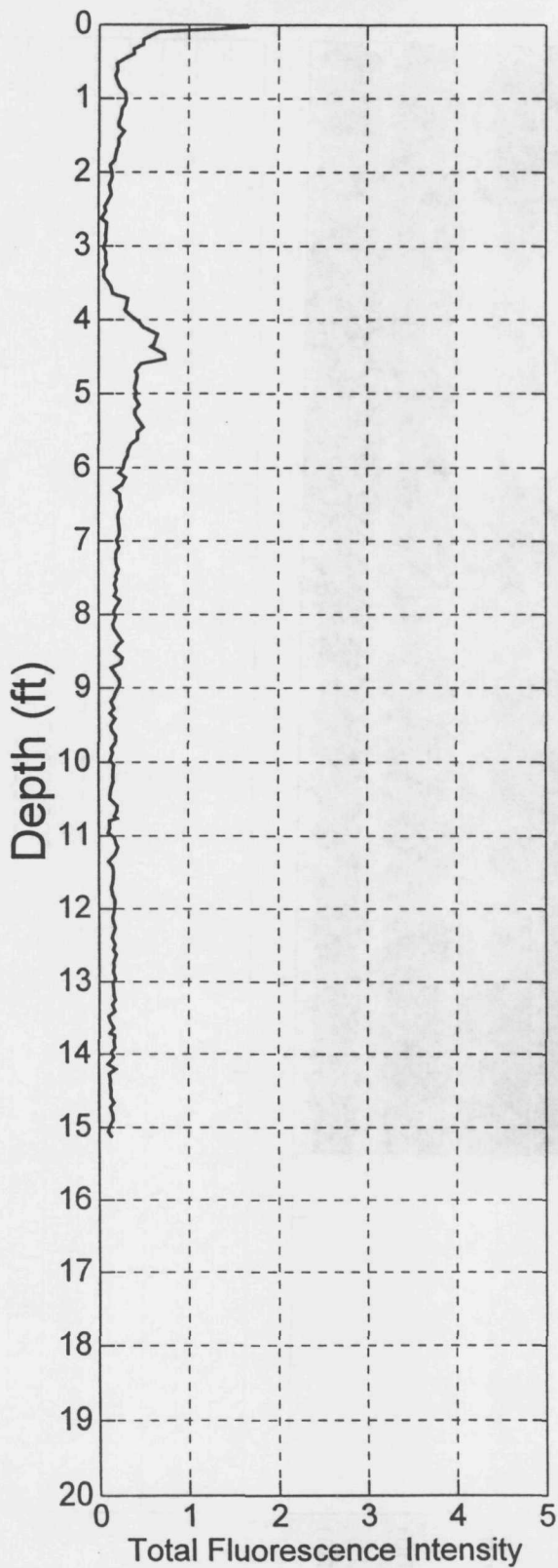
15.12 ft

Measured Peak Fluorescence

1.636%

Job#: 0301-8077

Acquisition Date: 04-28-1998



CPT13

Measured LIF End Depth

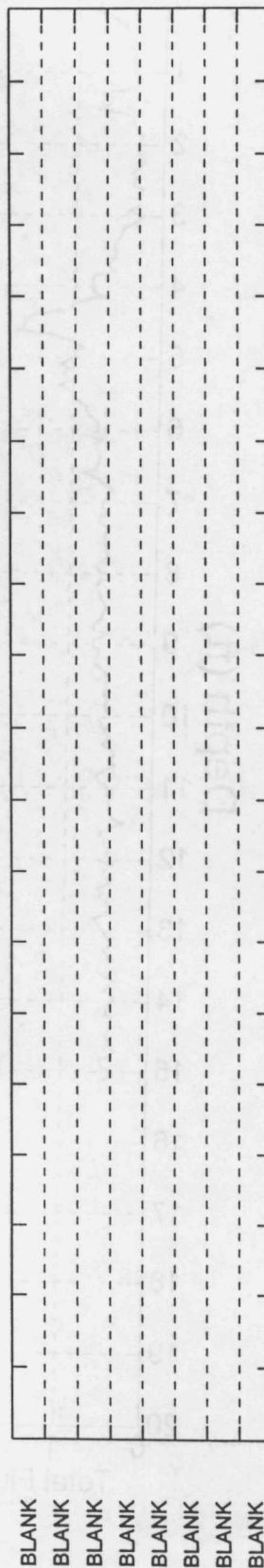
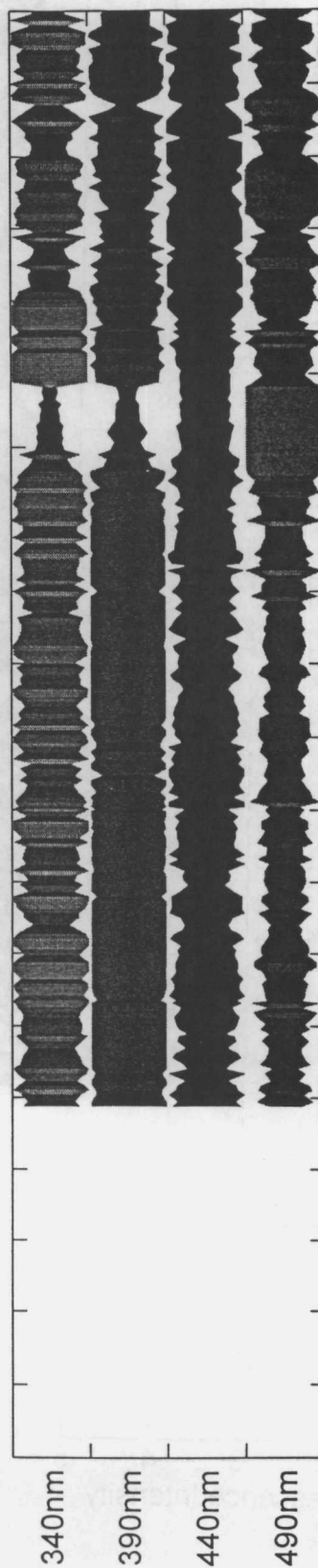
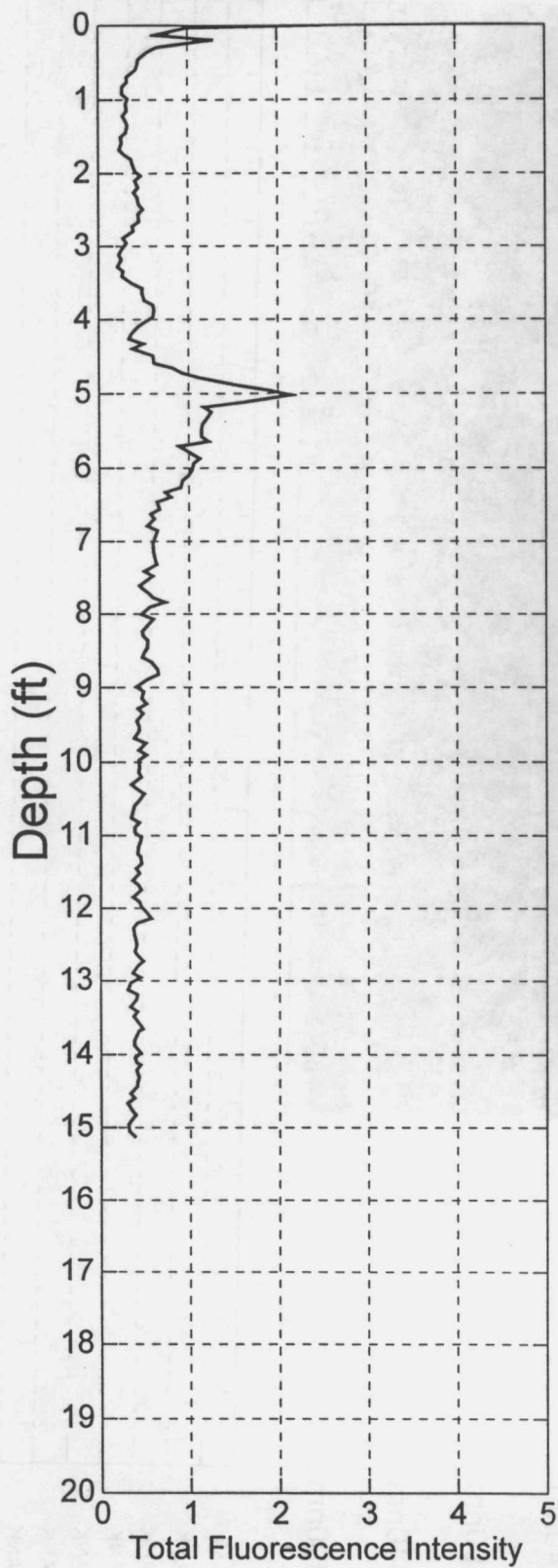
15.12 ft

Measured Peak Fluorescence

2.144%

Job#: 0301-8077

Acquisition Date: 04-28-1998



CPT14

Measured LIF End Depth

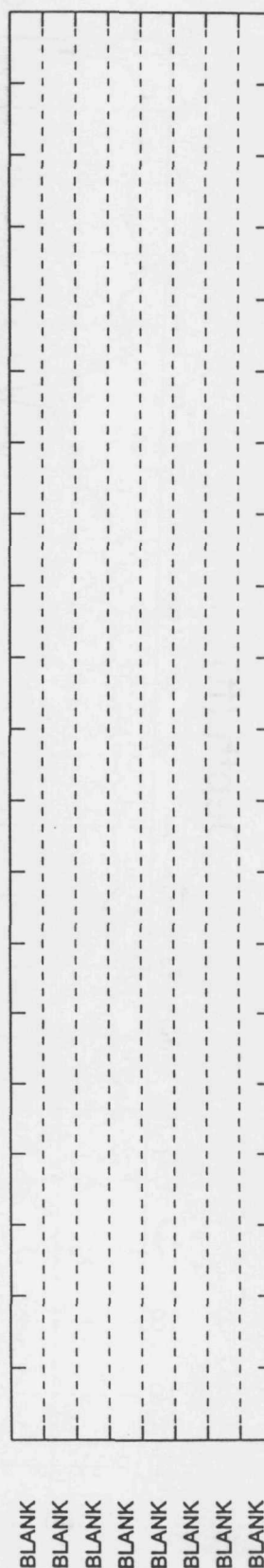
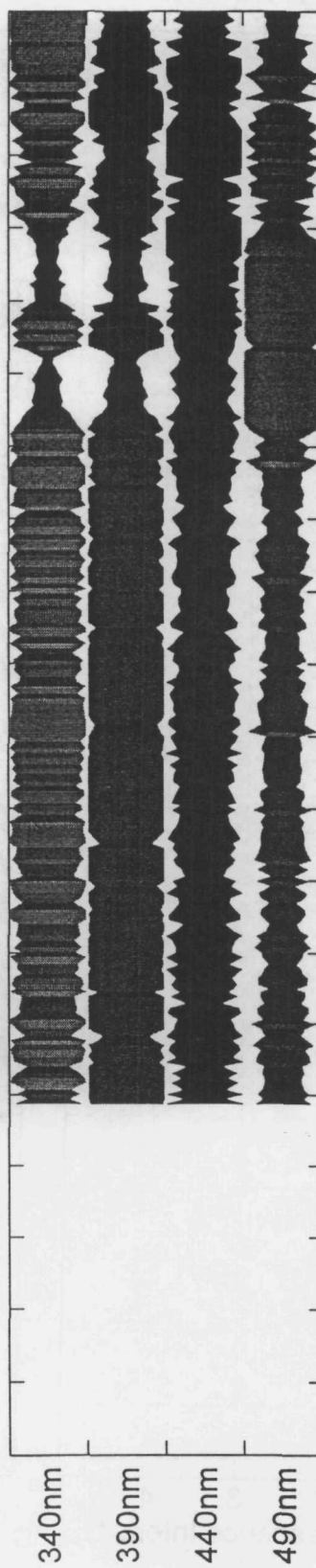
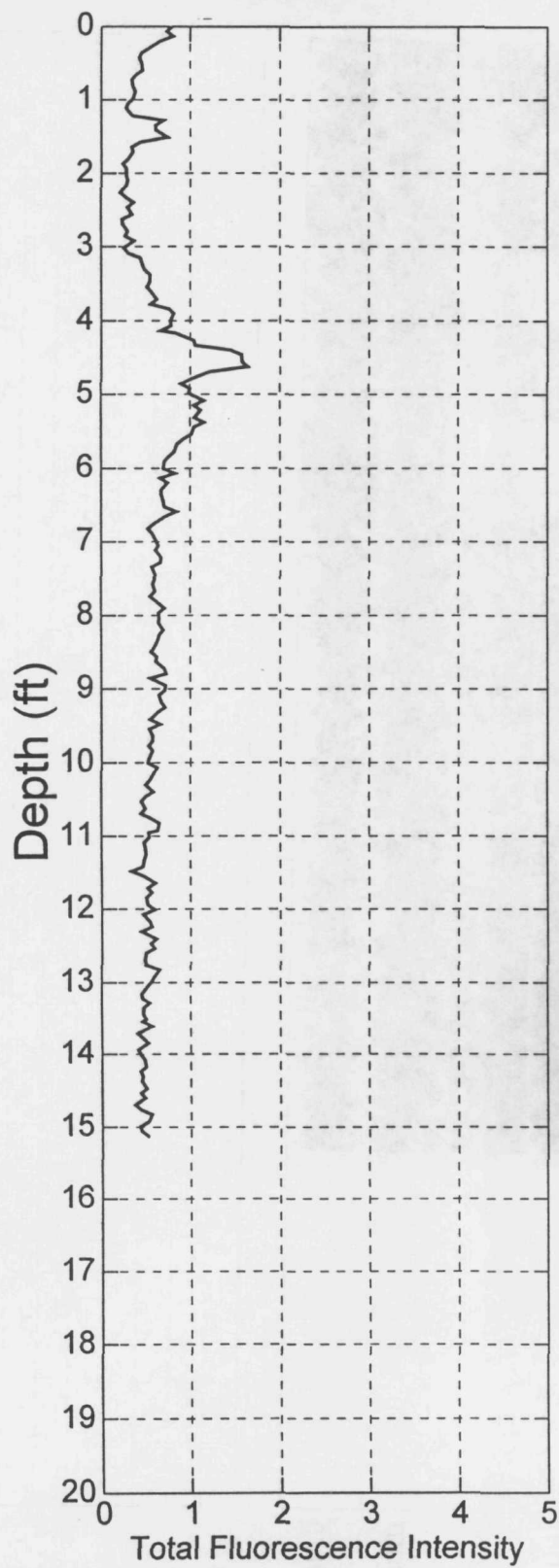
15.12 ft

Measured Peak Fluorescence

1.634%

Job#: 0301-8077

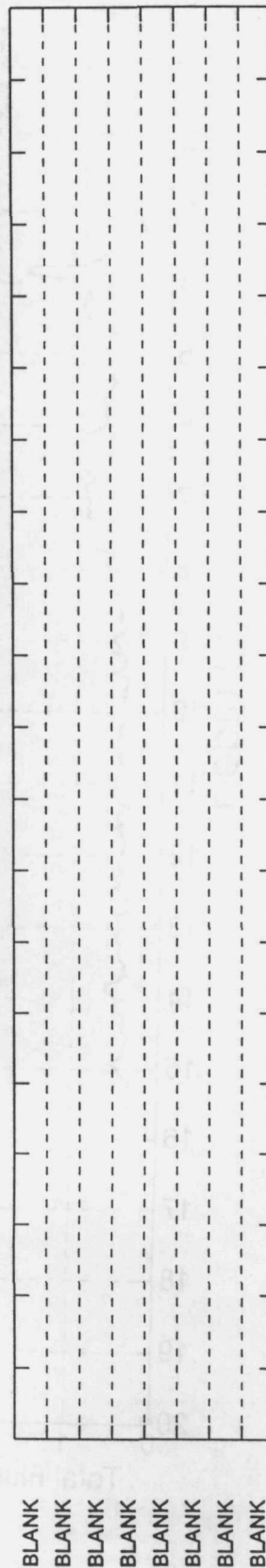
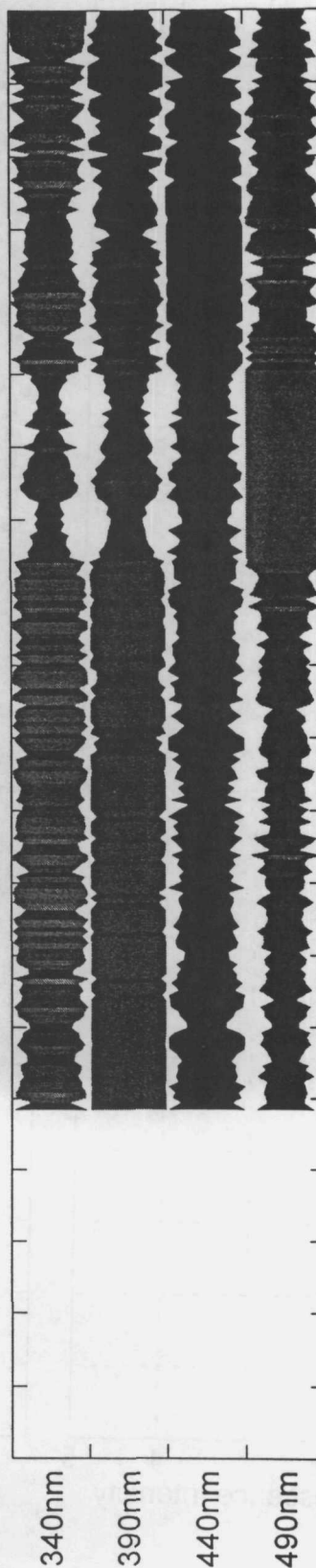
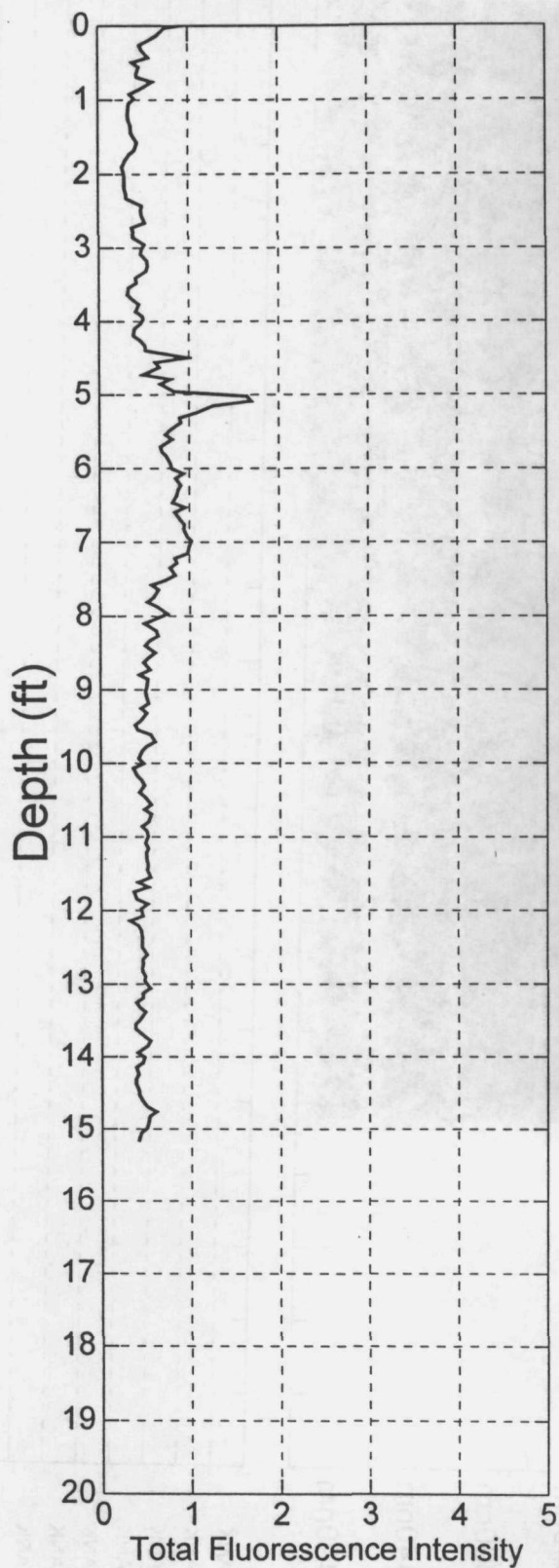
Acquisition Date: 04-28-1998



CPT15

Measured LIF End Depth
15.16 ft
Measured Peak Fluorescence
1.695%

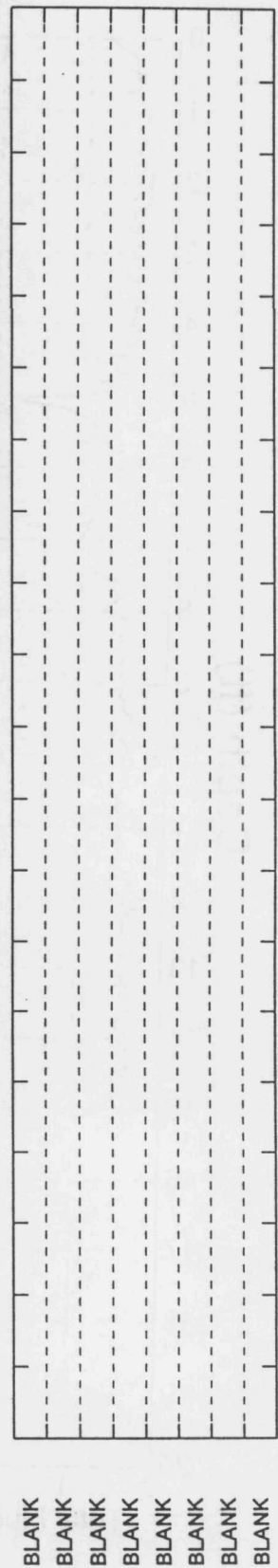
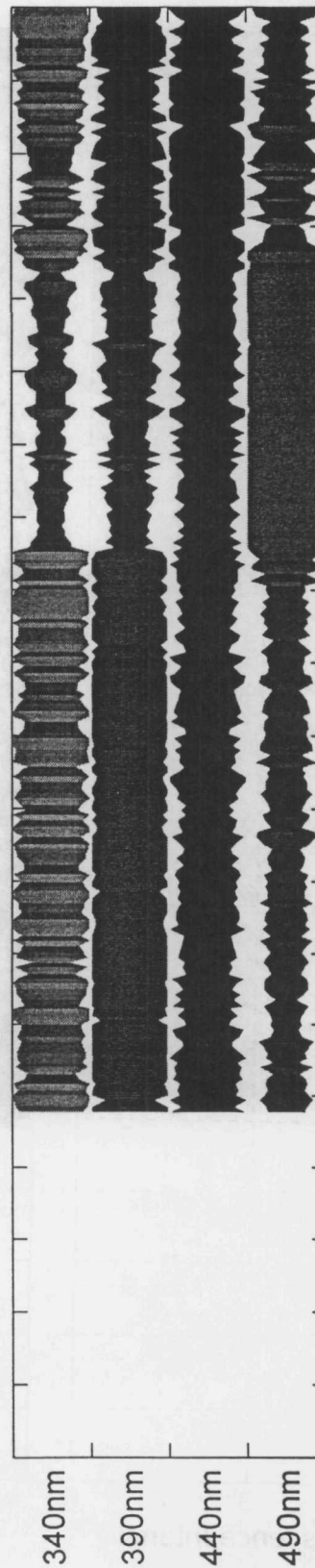
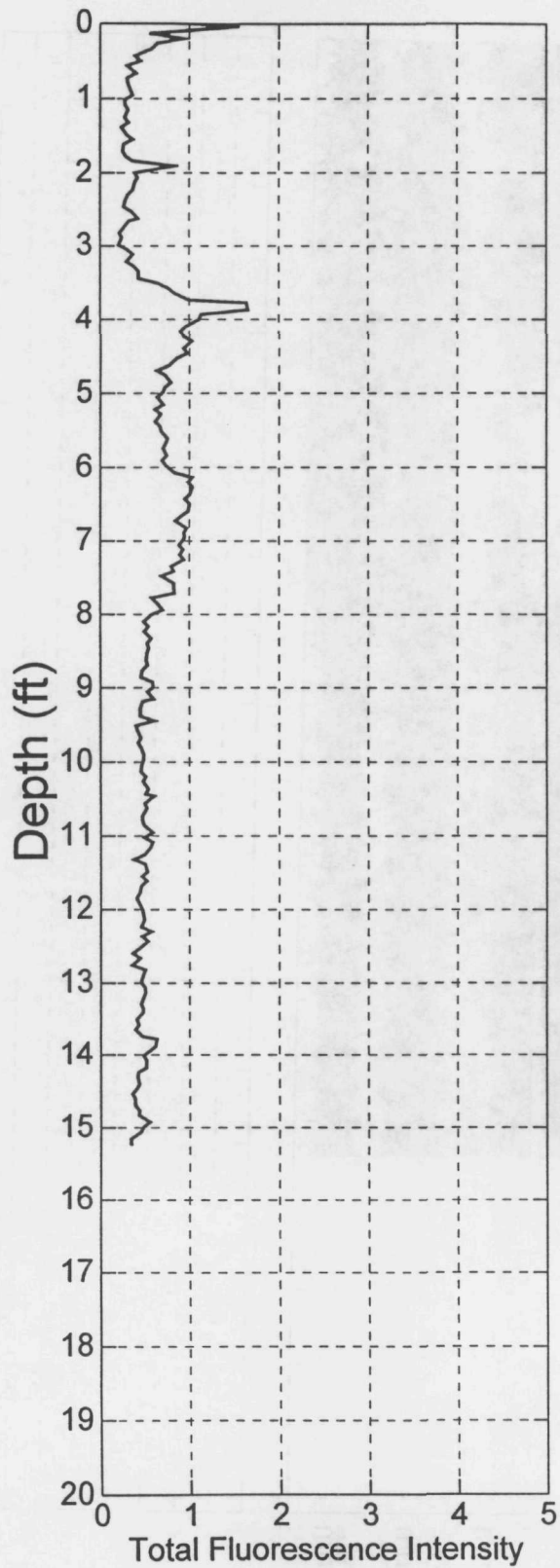
Job#: 0301-8077
Acquisition Date: 04-28-1998



CPT16

Measured LIF End Depth
15.22 ft
Measured Peak Fluorescence
1.65%

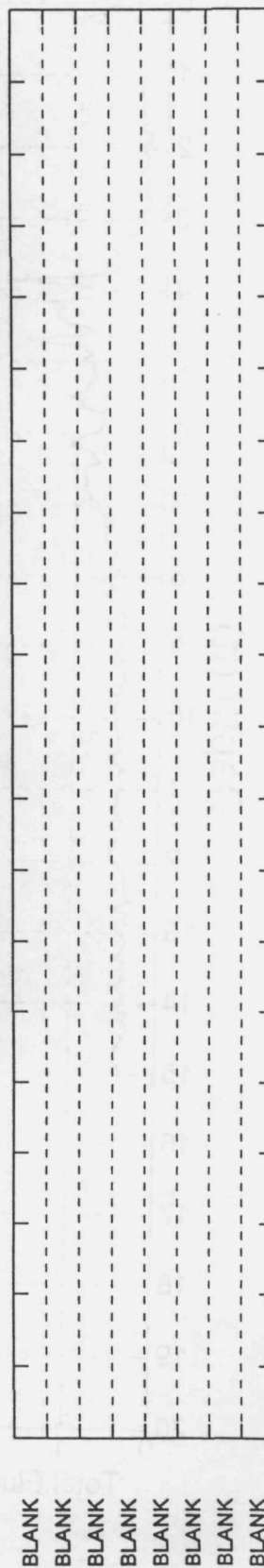
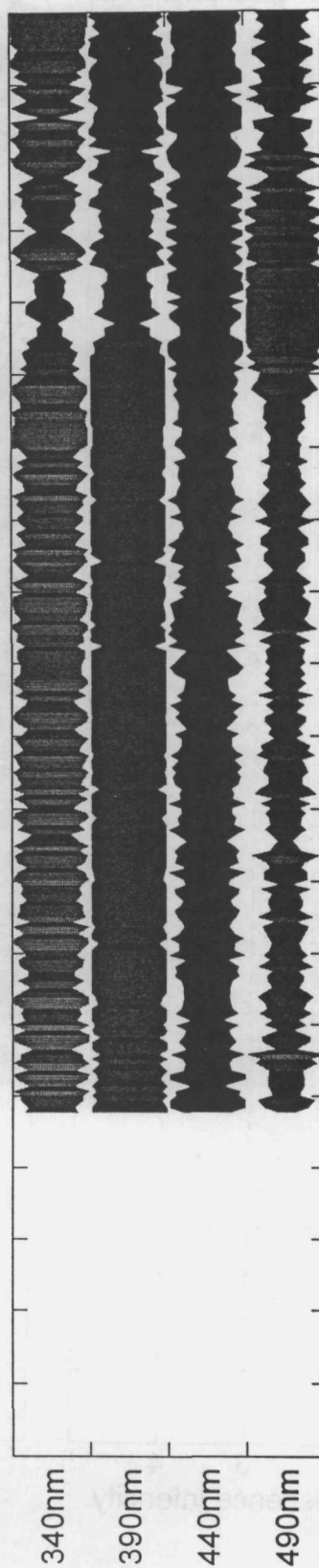
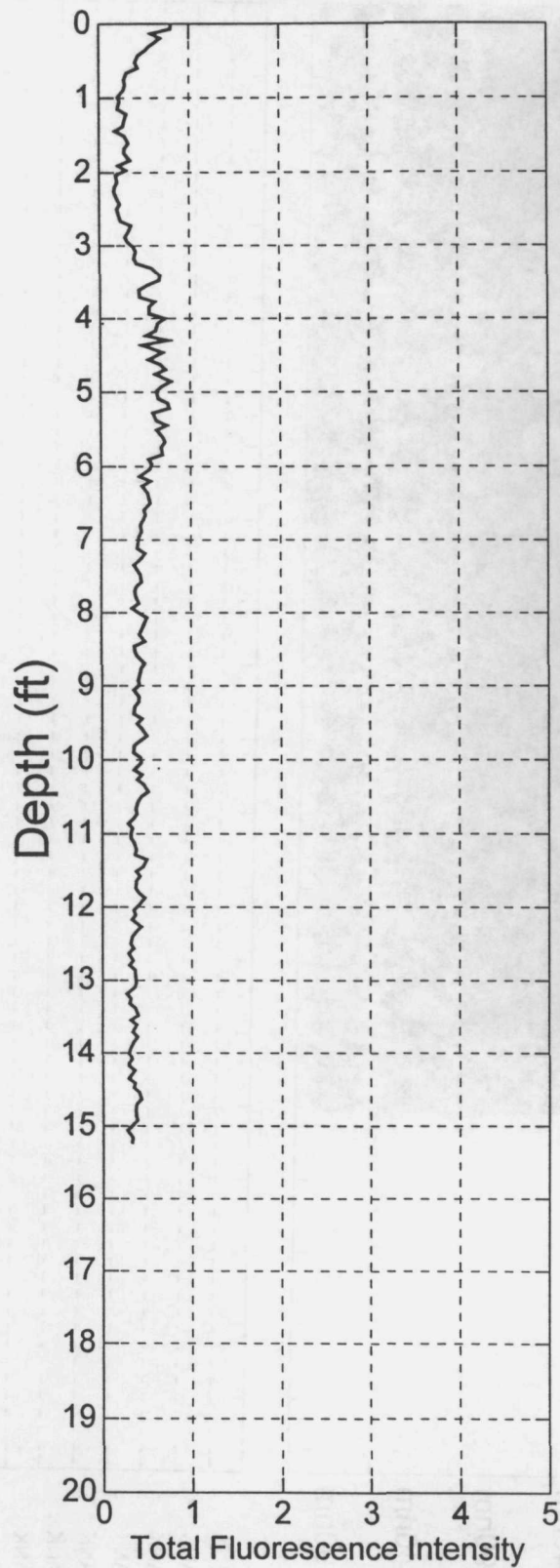
Job#: 0301-8077
Acquisition Date: 04-28-1998



CPT17

Measured LIF End Depth
15.22 ft
Measured Peak Fluorescence
0.795%

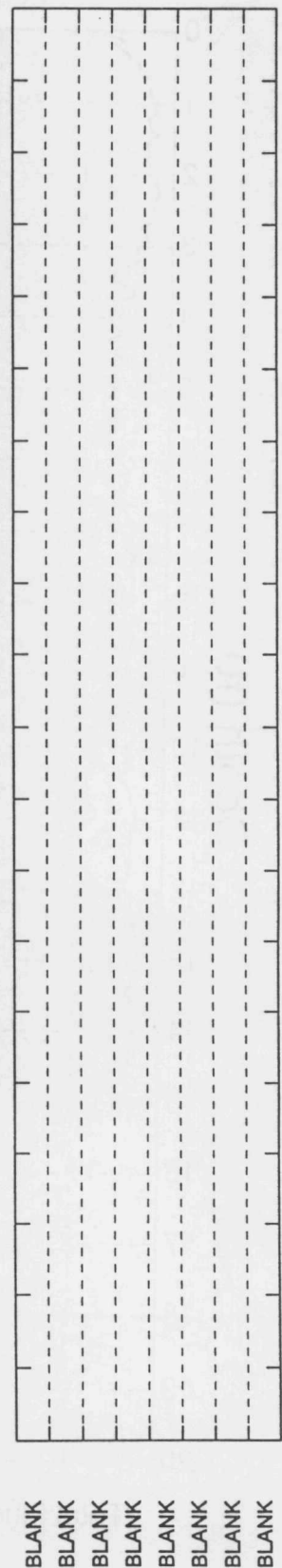
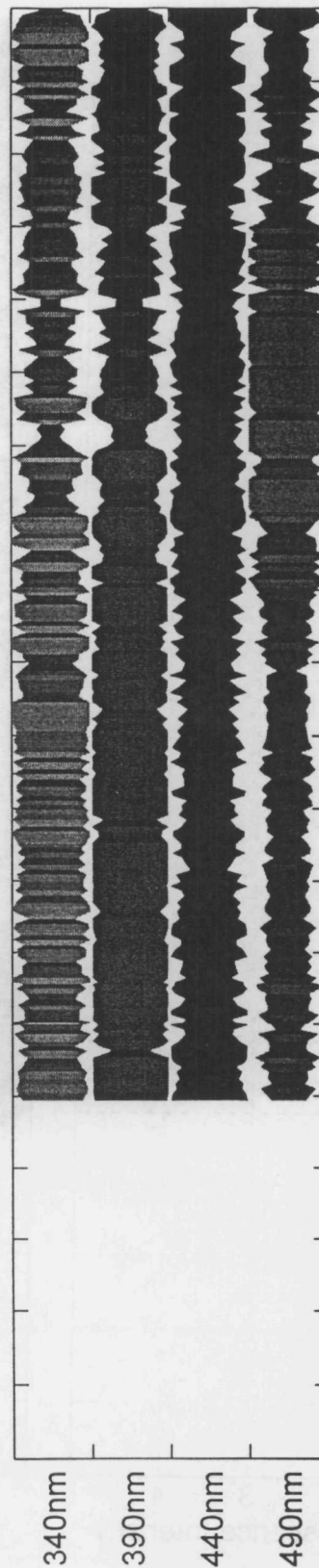
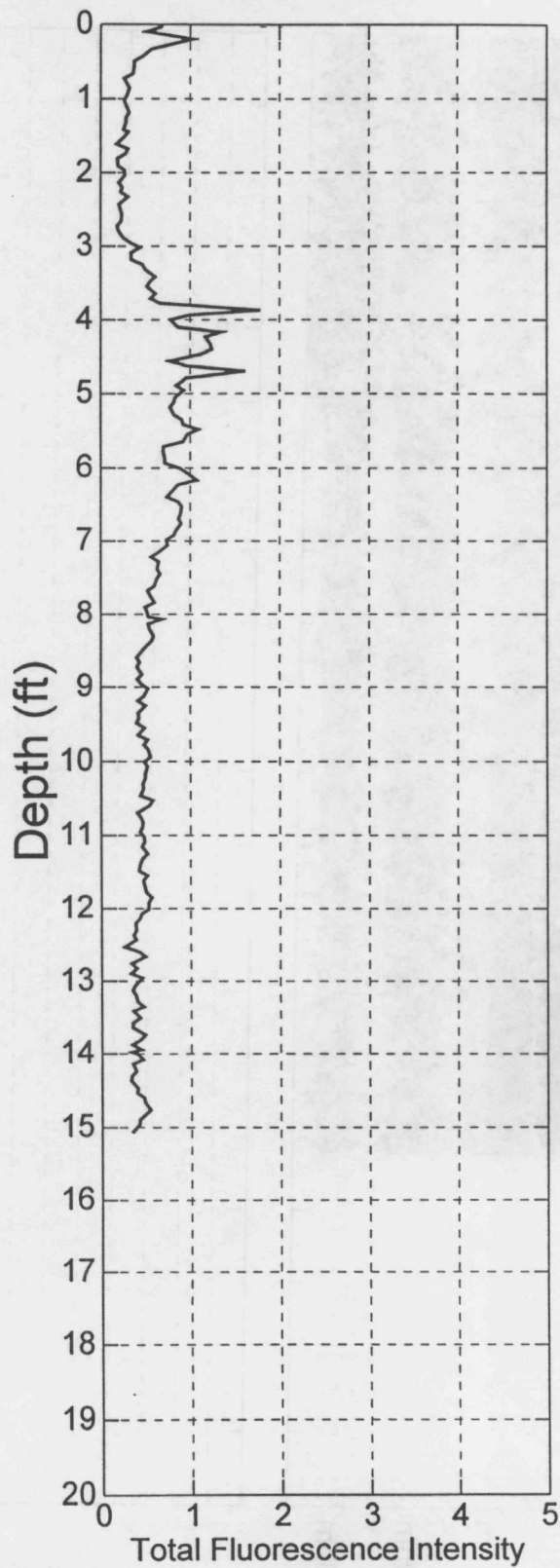
Job#: 0301-8077
Acquisition Date: 04-28-1998



CPT17A

Measured LIF End Depth
15.06 ft
Measured Peak Fluorescence
1.781%

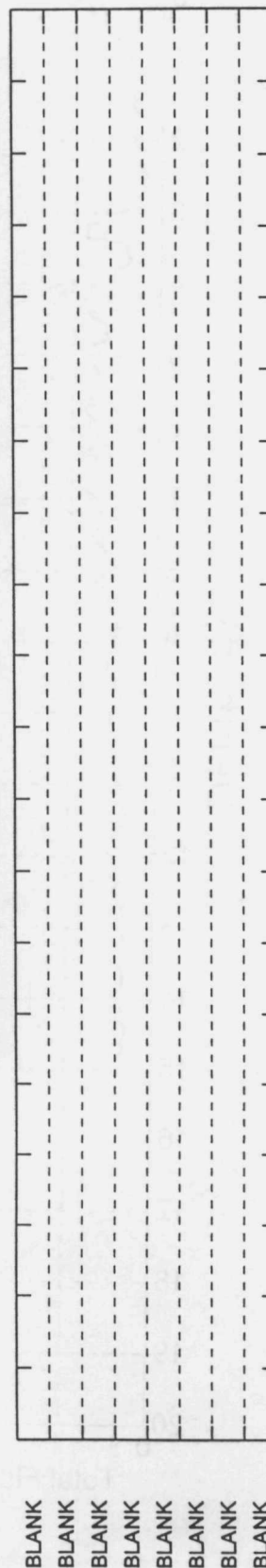
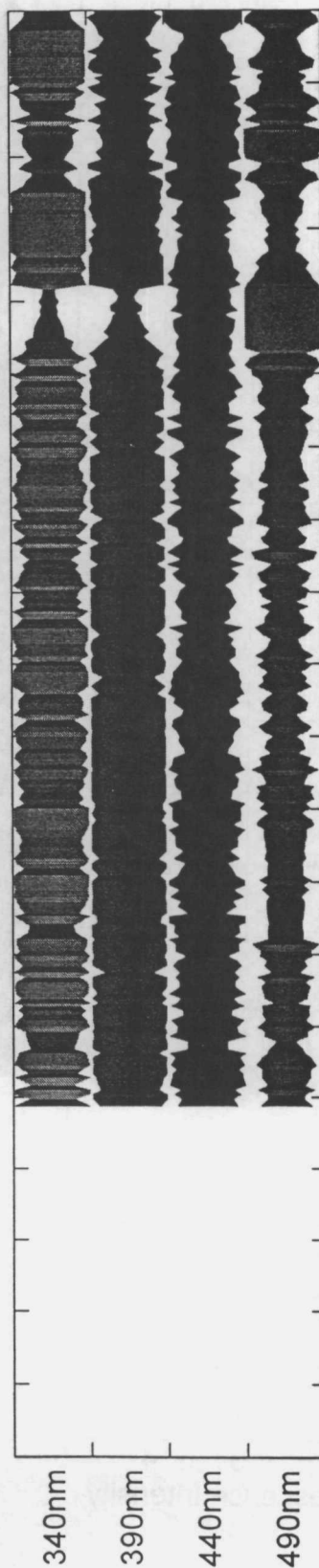
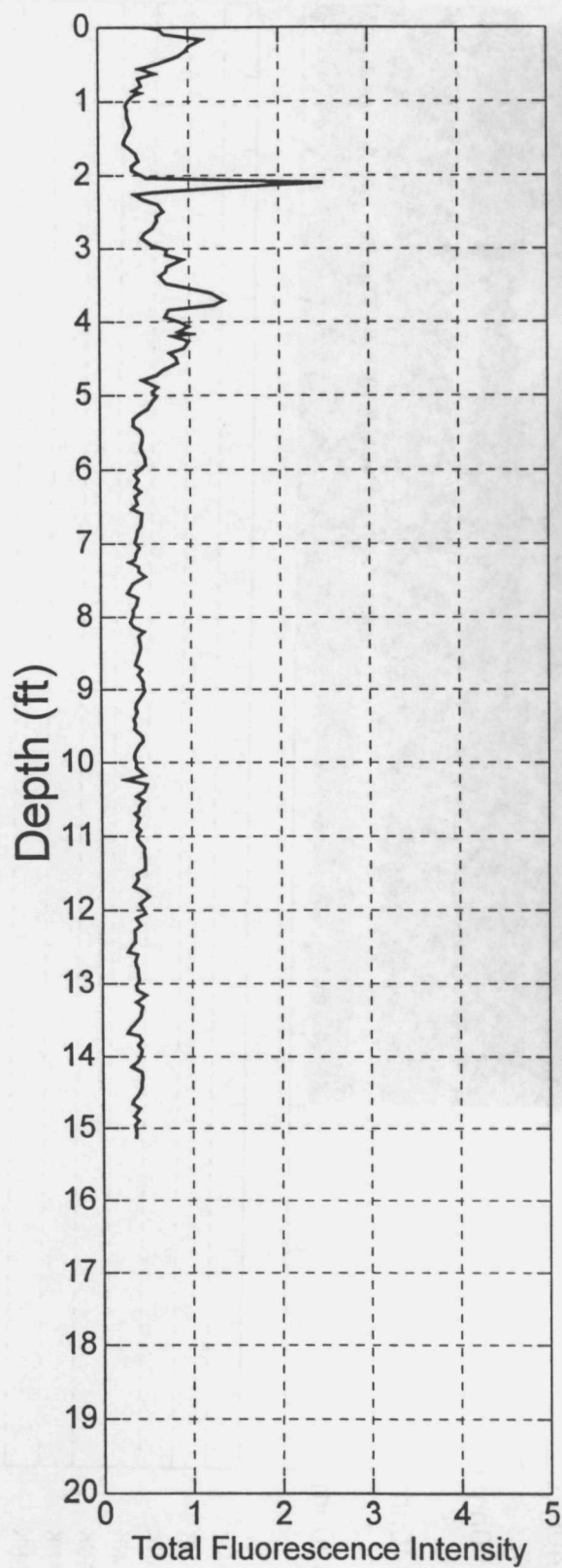
Job#: 0301-8077
Acquisition Date: 04-28-1998



CPT18

Measured LIF End Depth
15.12 ft
Measured Peak Fluorescence
2.491%

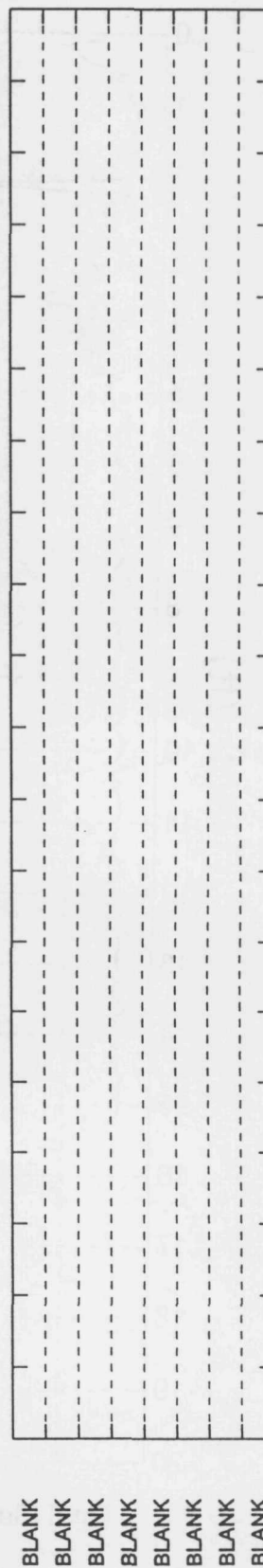
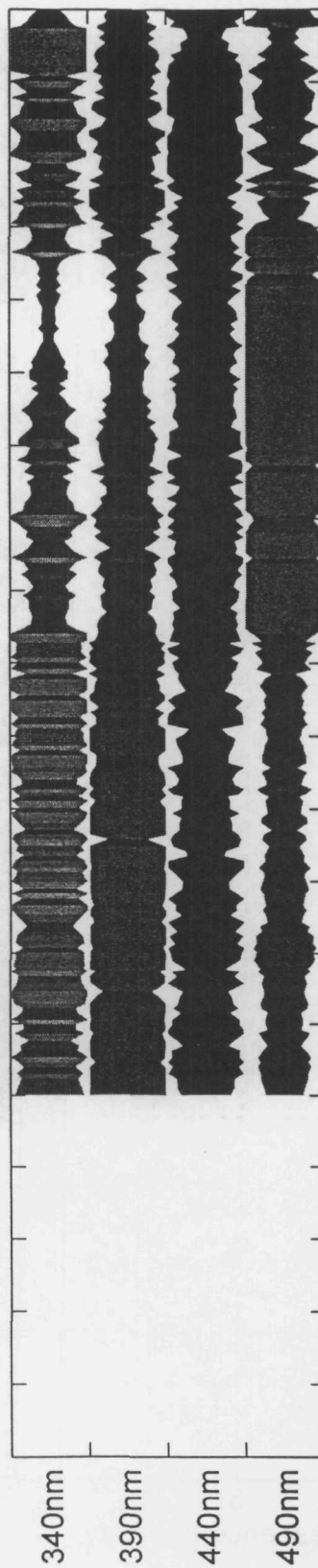
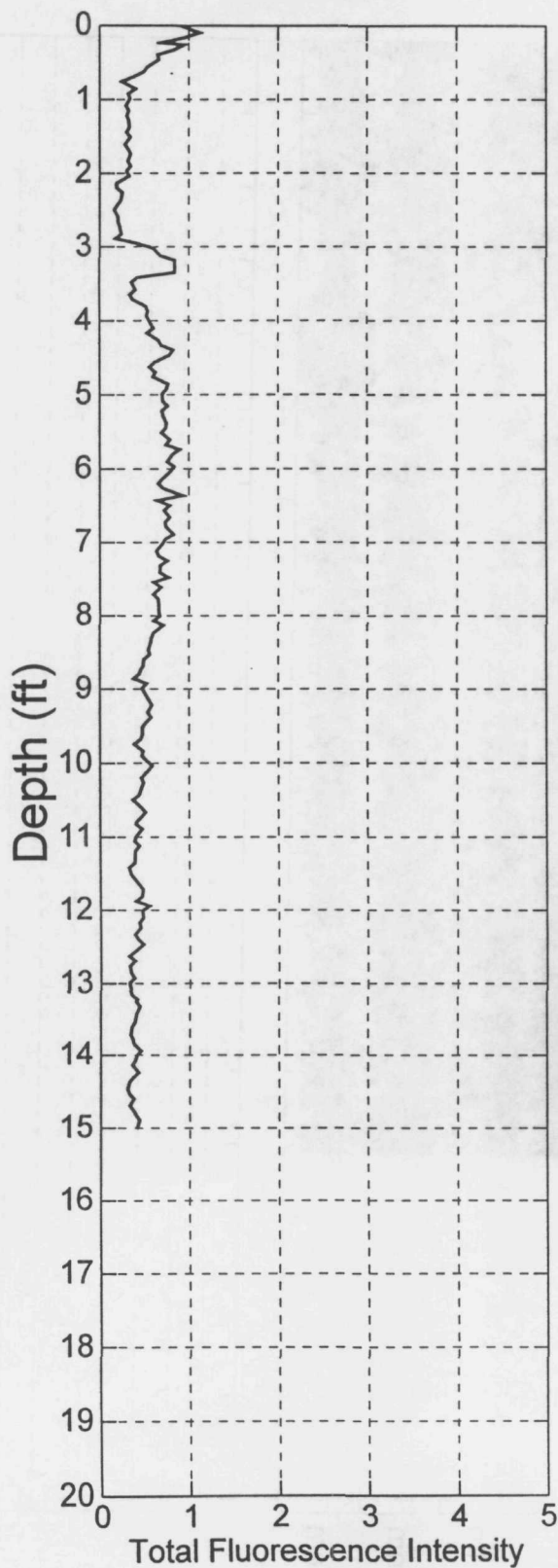
Job#: 0301-8077
Acquisition Date: 04-28-1998



CPT19

Measured LIF End Depth
14.99 ft
Measured Peak Fluorescence
1.118%

Job#: 0301-8077
Acquisition Date: 04-28-1998



CPT20

Measured LIF End Depth

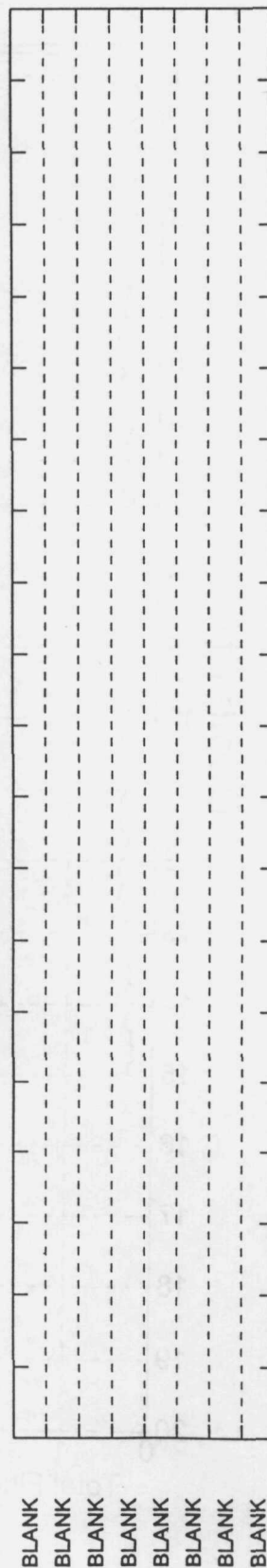
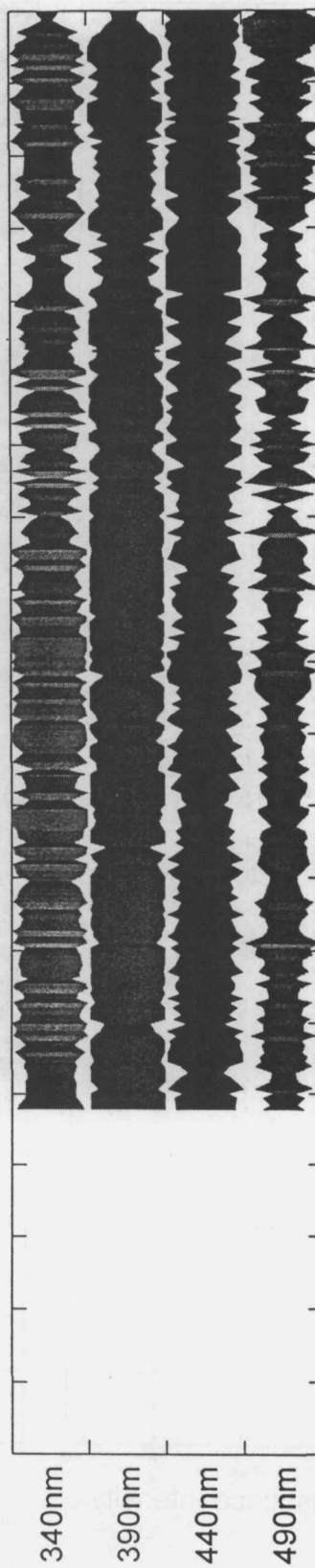
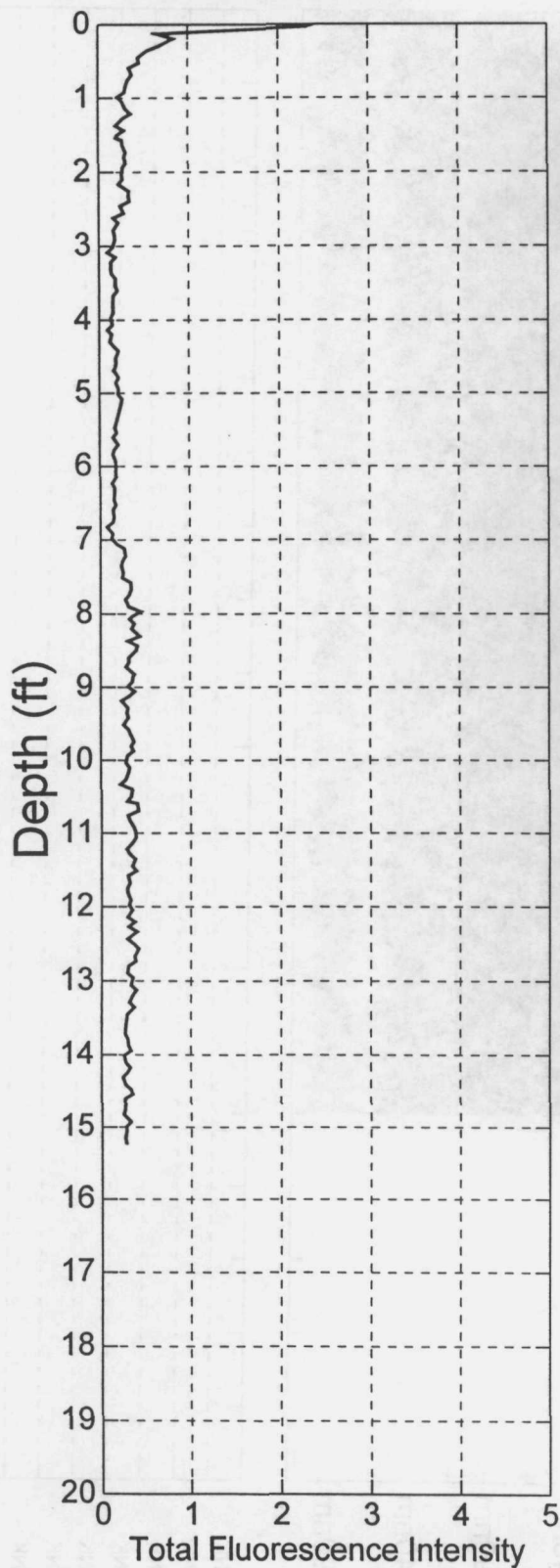
15.22 ft

Measured Peak Fluorescence

2.307%

Job#: 0301-8077

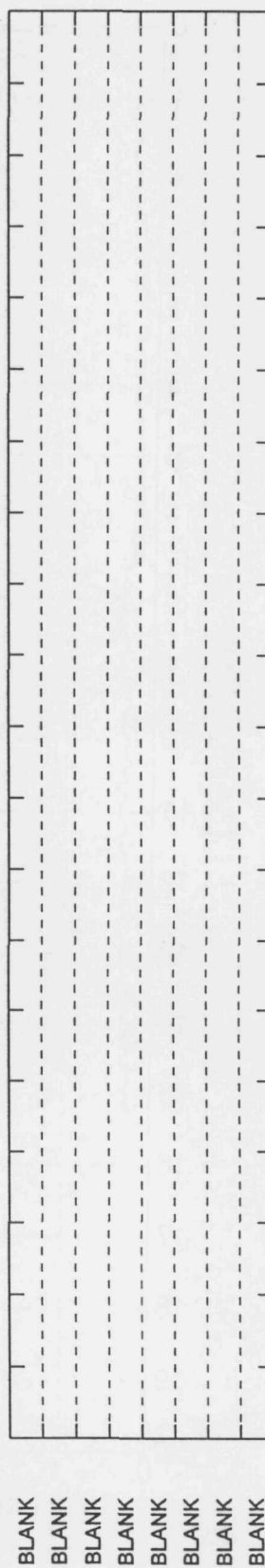
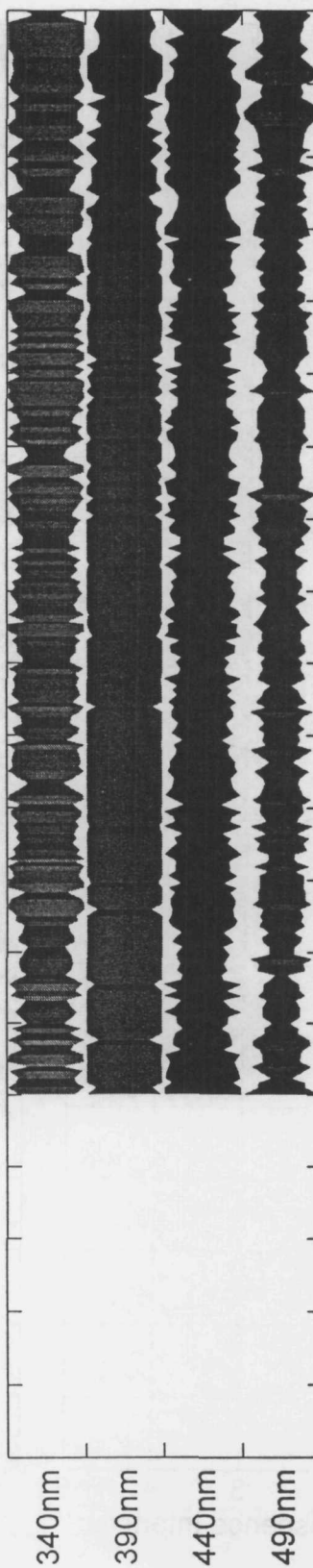
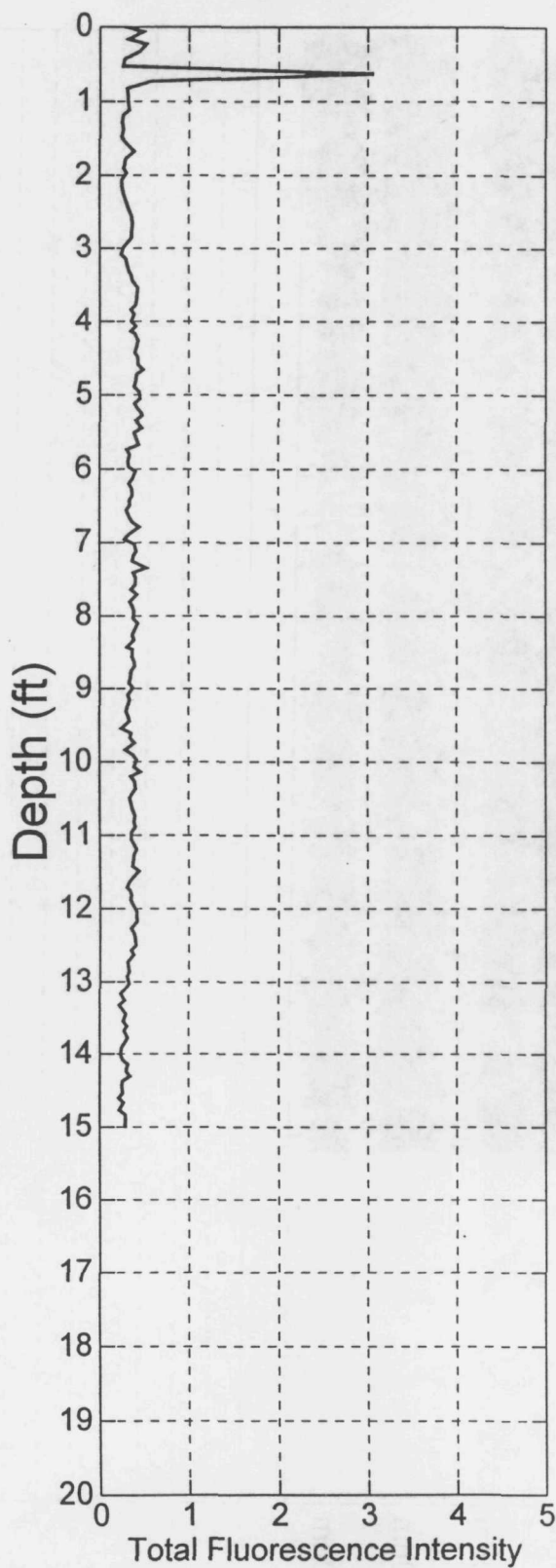
Acquisition Date: 04-28-1998



CPT21

Measured LIF End Depth
14.99 ft
Measured Peak Fluorescence
3.058%

Job#: 0301-8077
Acquisition Date: 04-28-1998



CPT22

Measured LIF End Depth

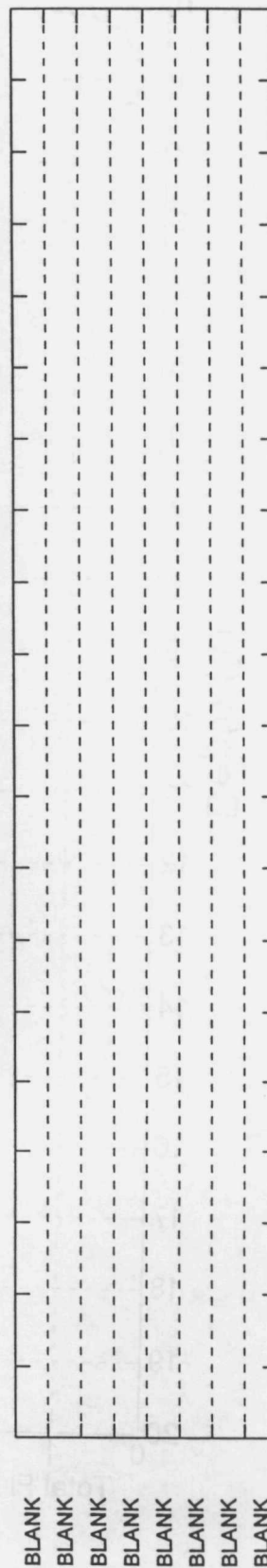
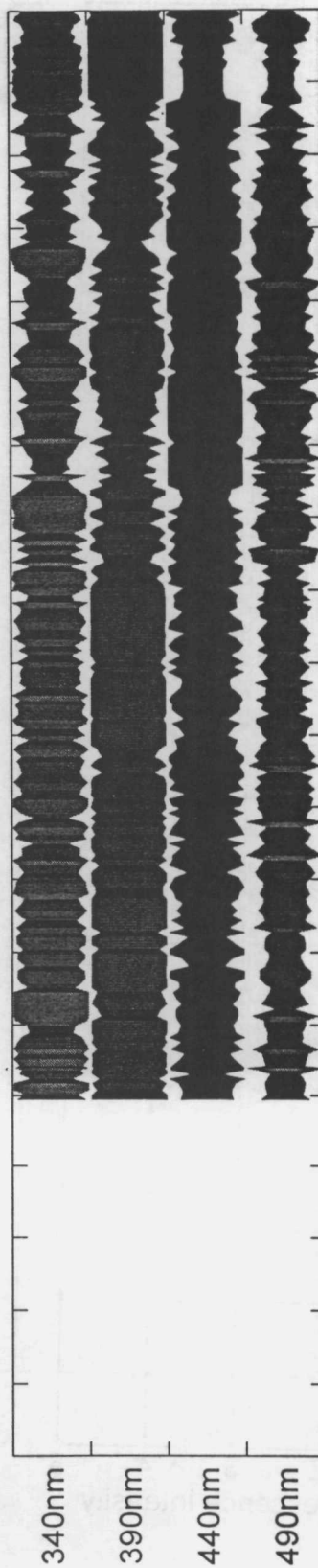
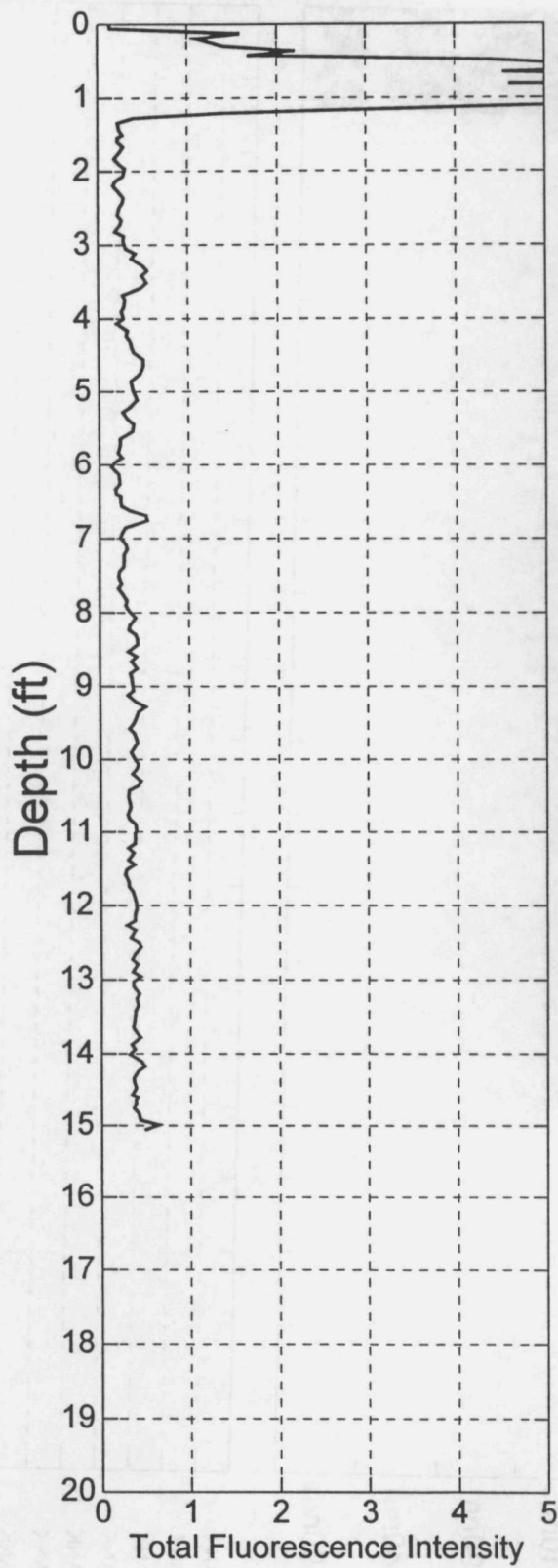
15.06 ft

Measured Peak Fluorescence

12.05%

Job#: 0301-8077

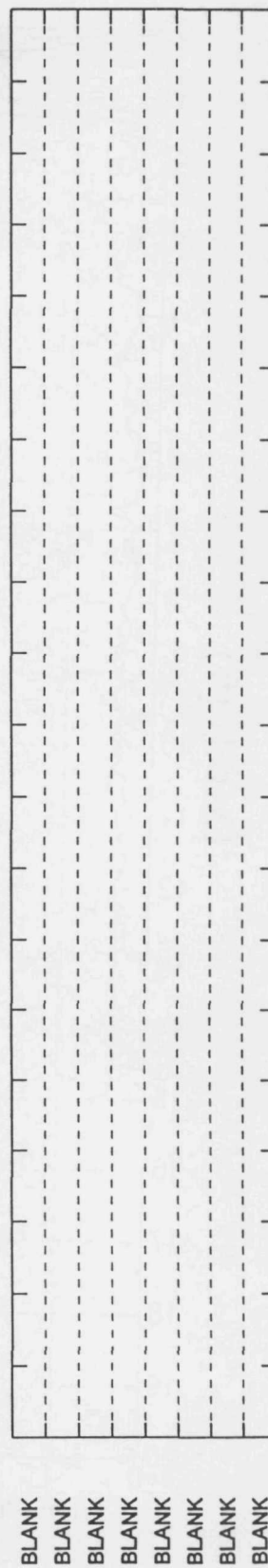
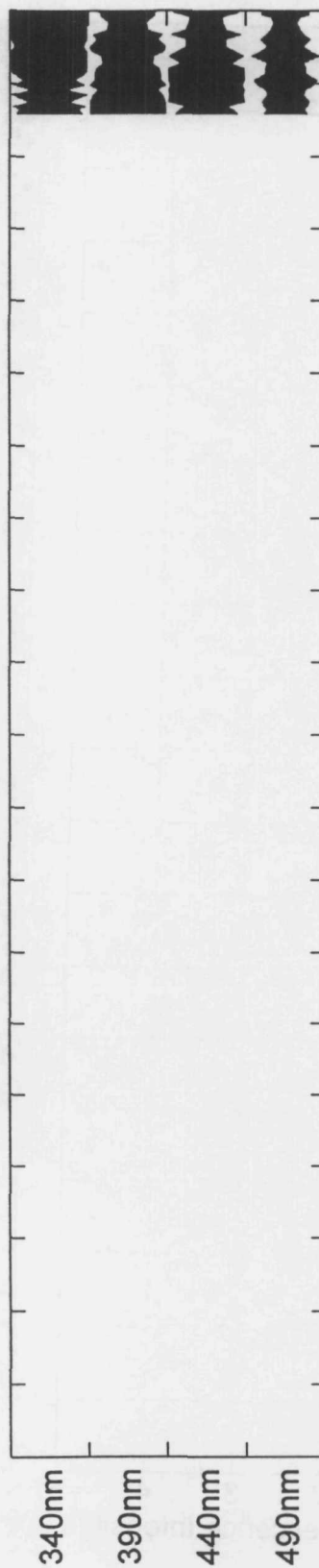
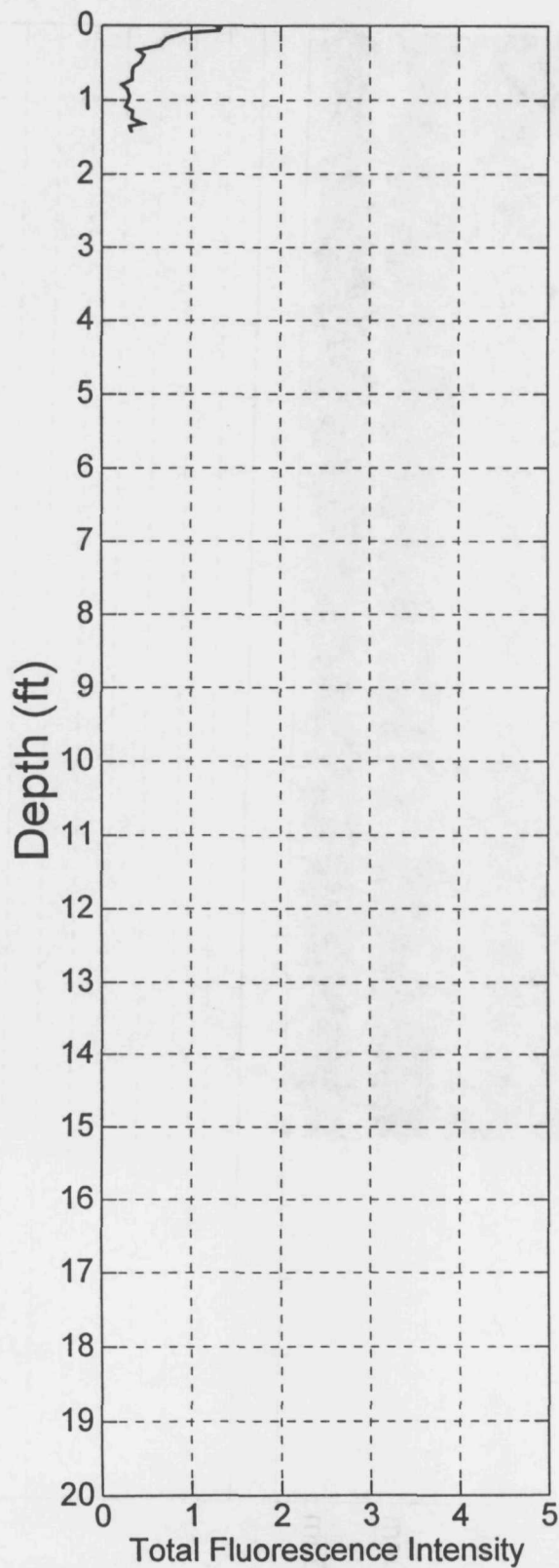
Acquisition Date: 04-28-1998



CPT23

Measured LIF End Depth
1.411 ft
Measured Peak Fluorescence
1.324%

Job#: 0301-8077
Acquisition Date: 04-28-1998



CPT23A

Measured LIF End Depth

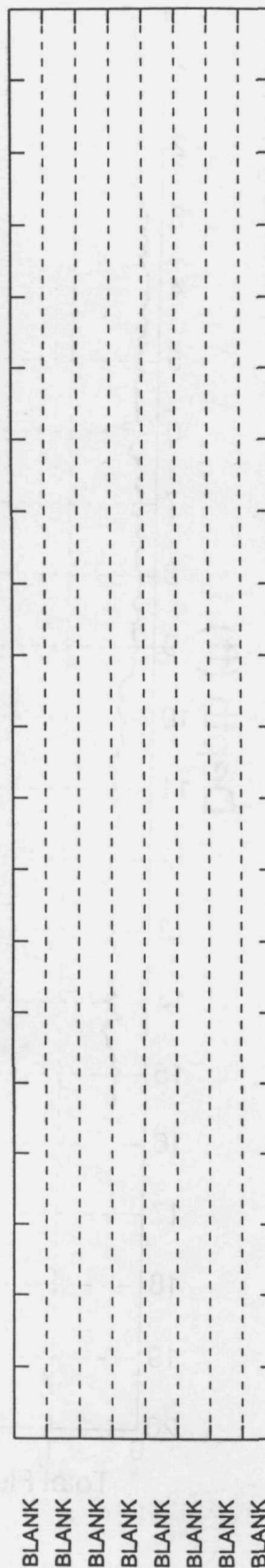
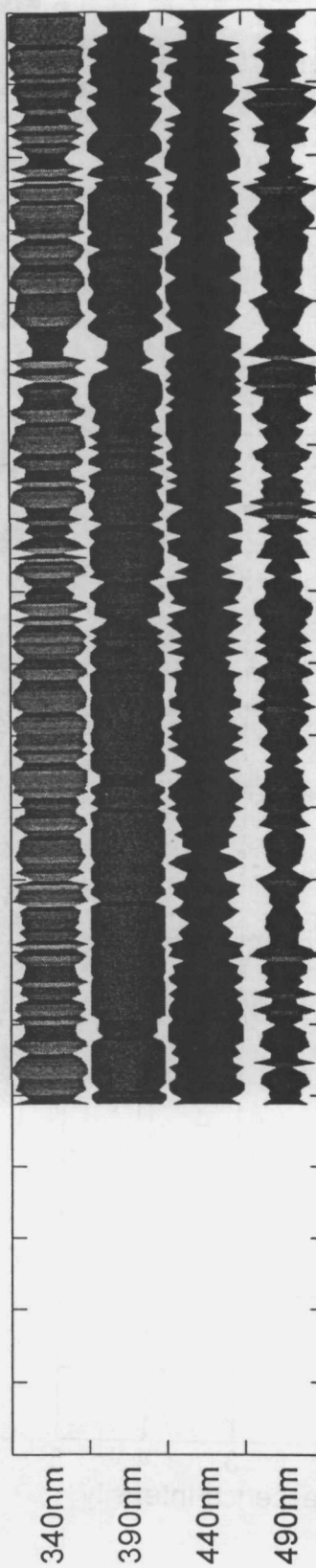
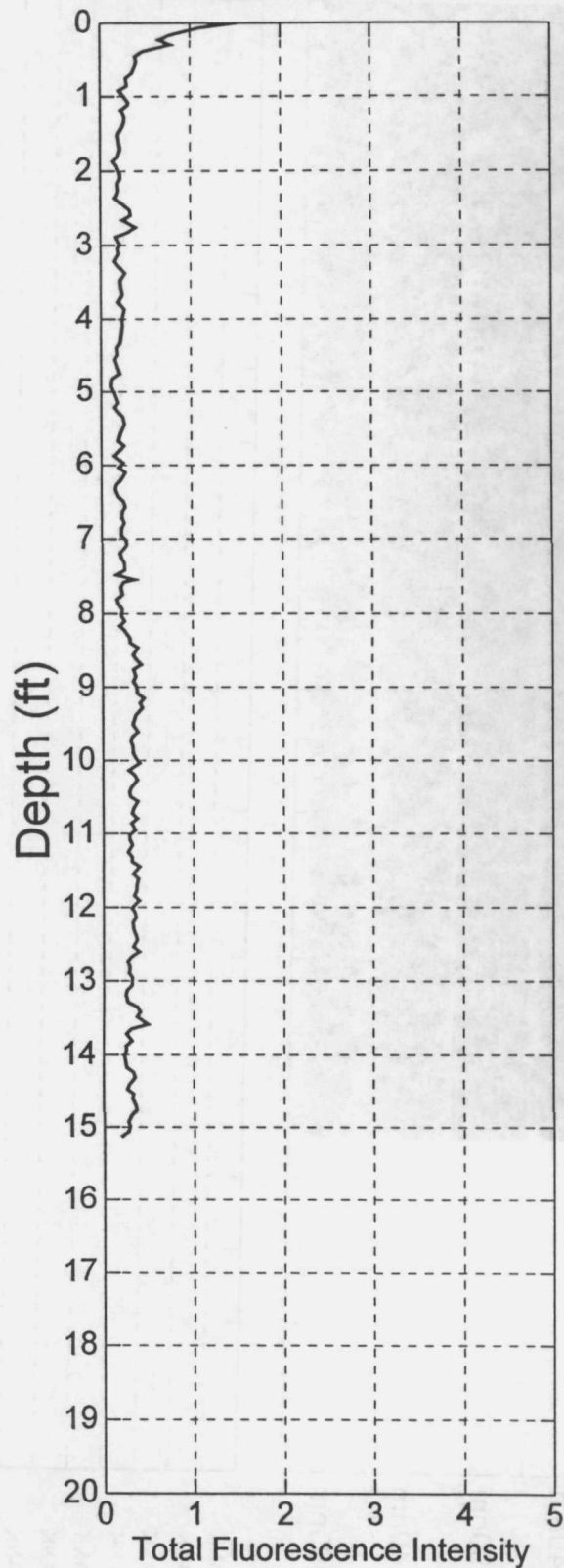
15.12 ft

Measured Peak Fluorescence

1.094%

Job#: 0301-8077

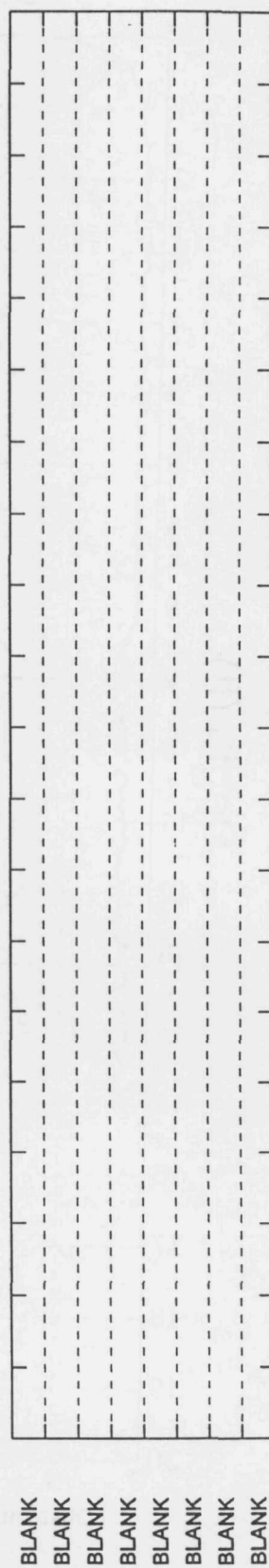
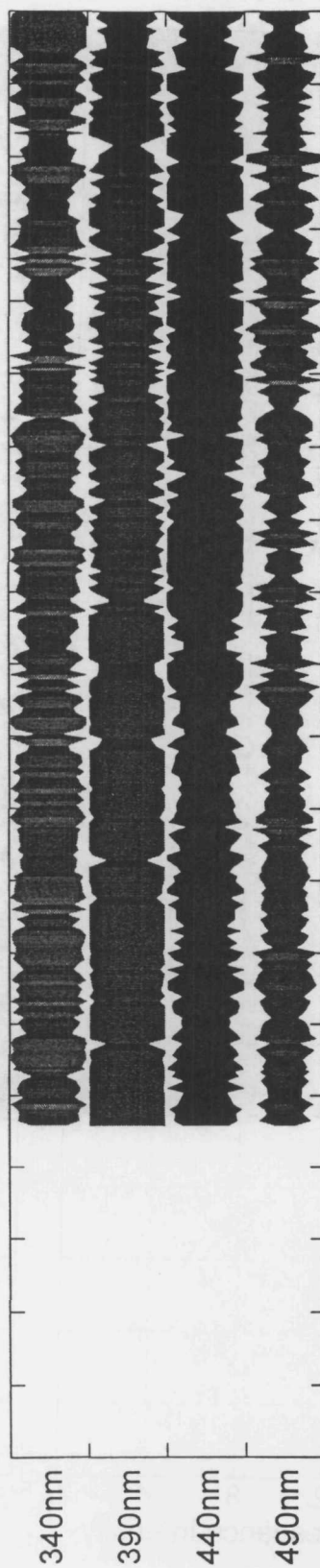
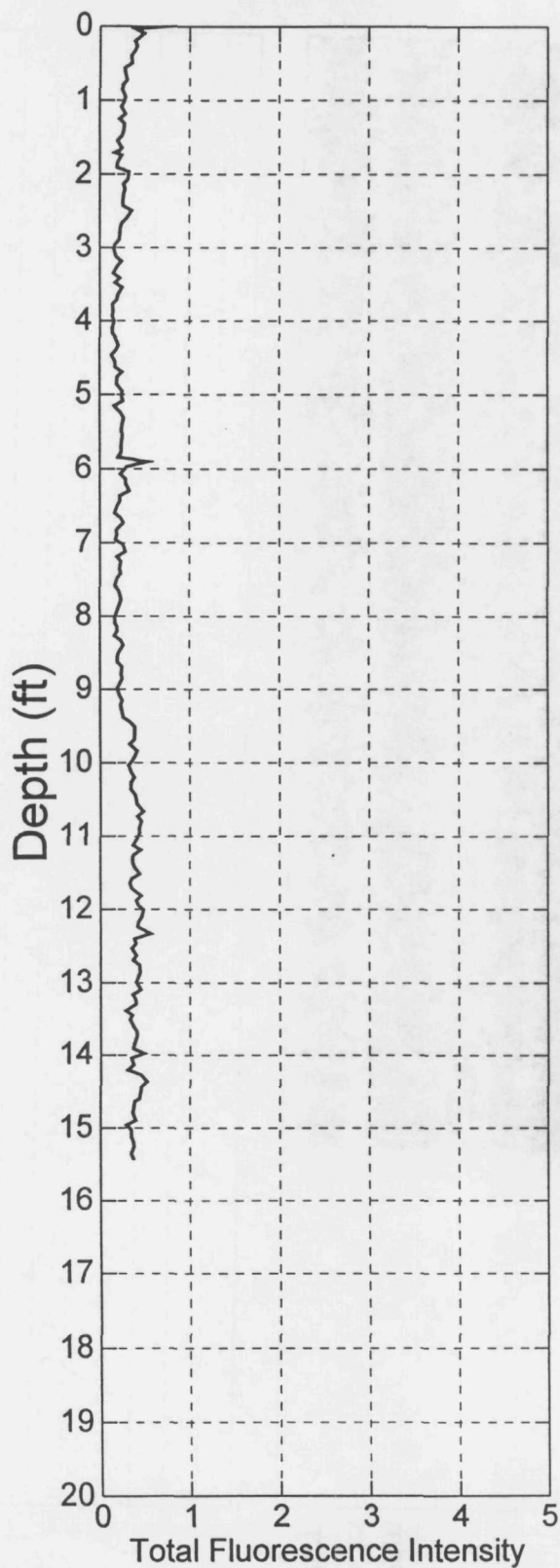
Acquisition Date: 04-28-1998



CPT24

Measured LIF End Depth
15.42 ft
Measured Peak Fluorescence
0.5541%

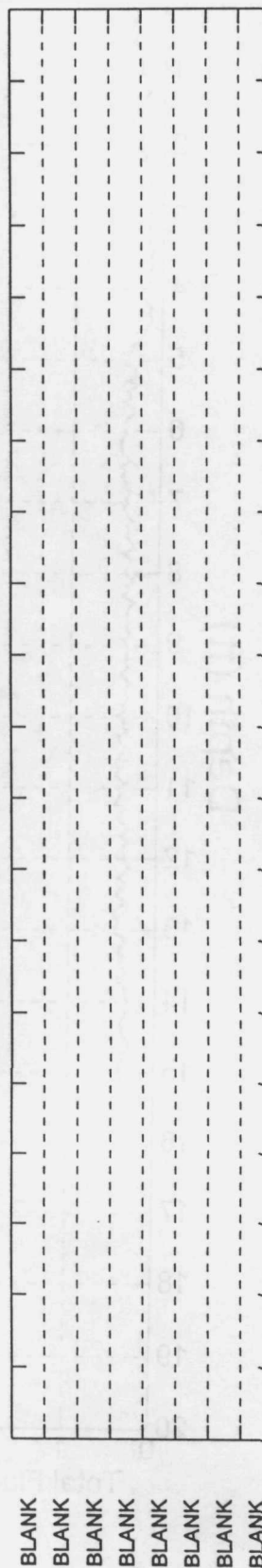
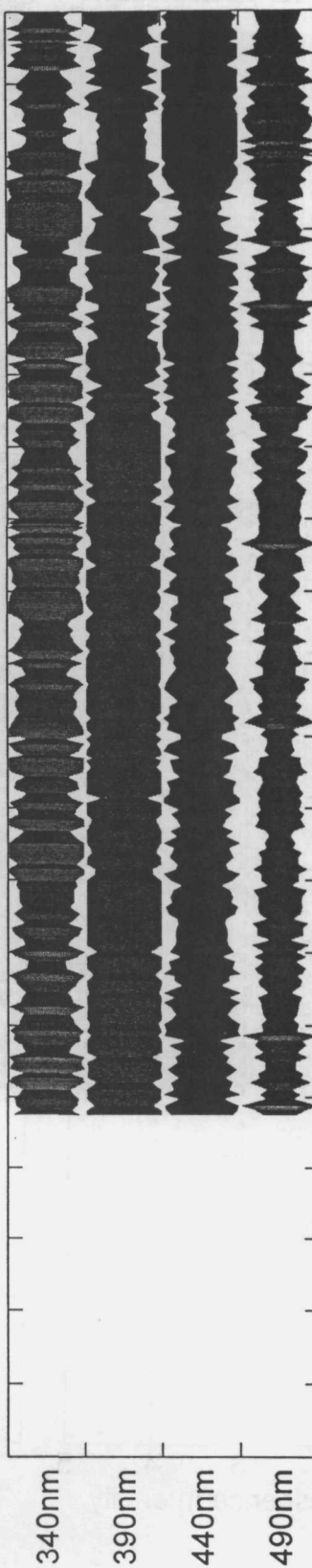
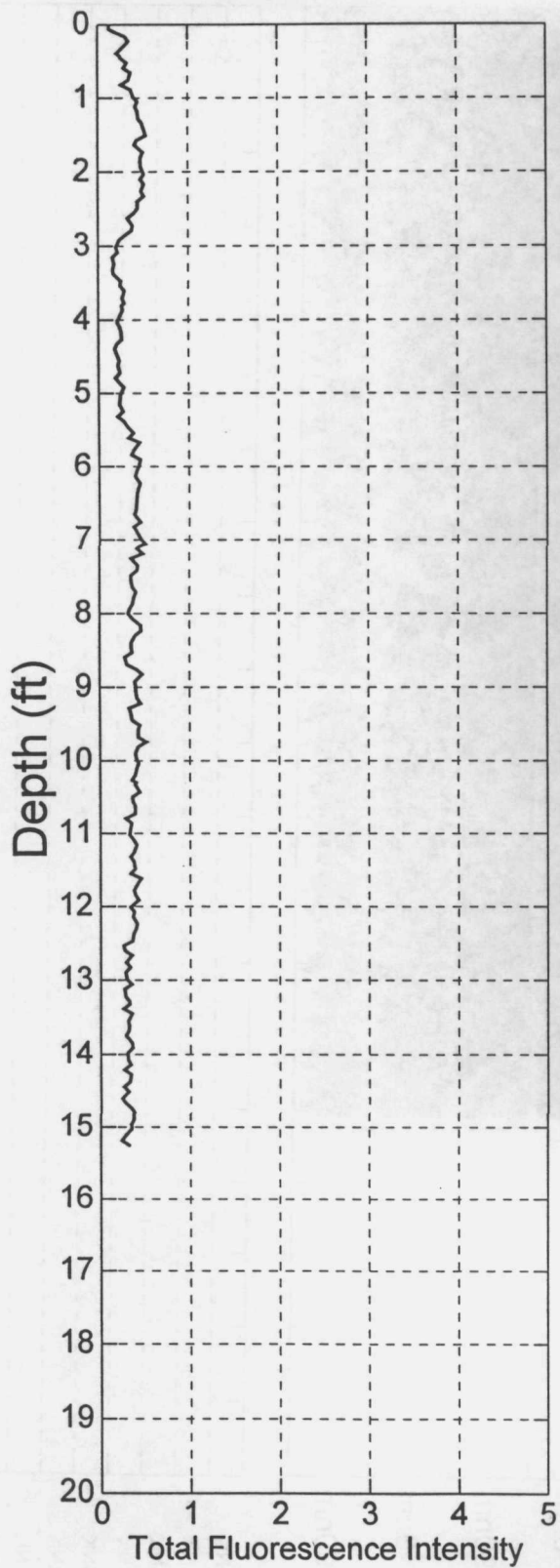
Job#: 0301-8077
Acquisition Date: 04-28-1998



CPT25

Measured LIF End Depth
15.26 ft
Measured Peak Fluorescence
0.5303%

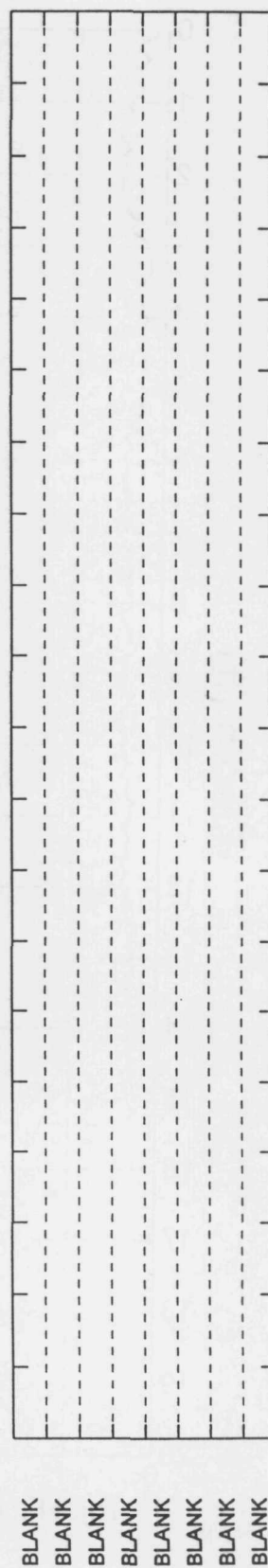
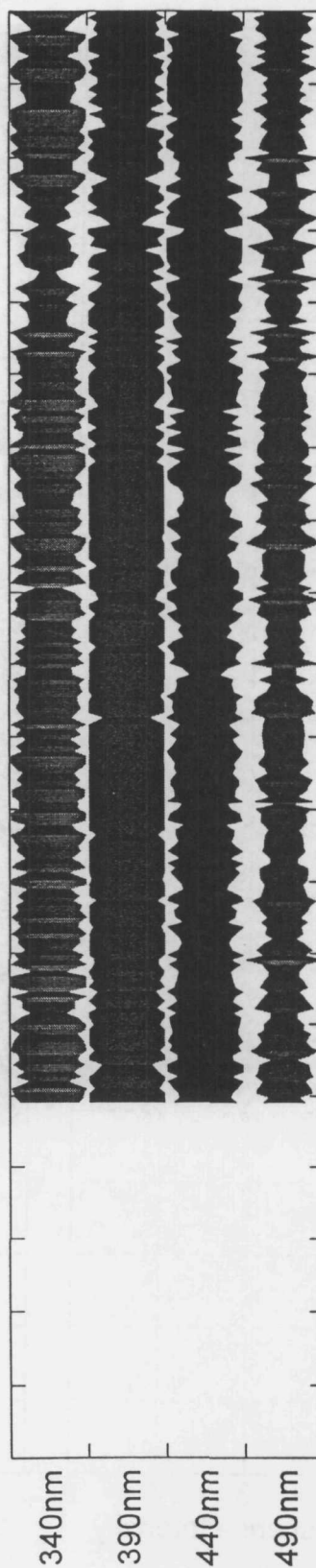
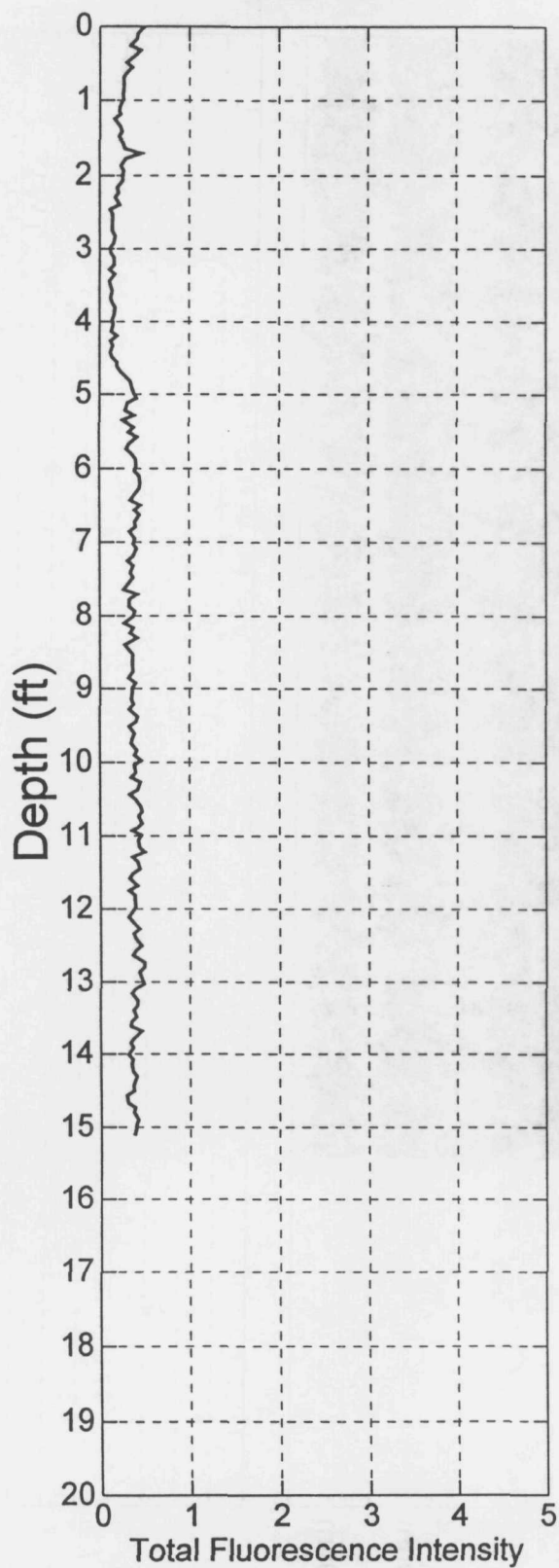
Job#: 0301-8077
Acquisition Date: 04-28-1998



CPT26

Measured LIF End Depth
15.09 ft
Measured Peak Fluorescence
0.4943%

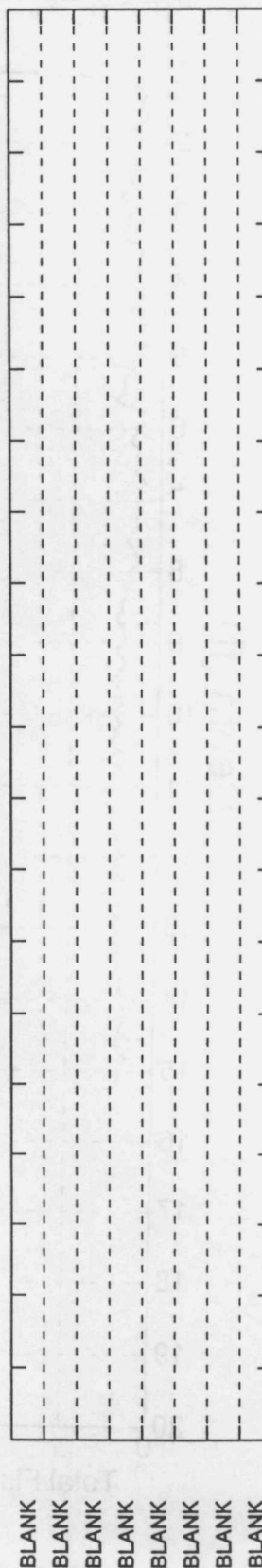
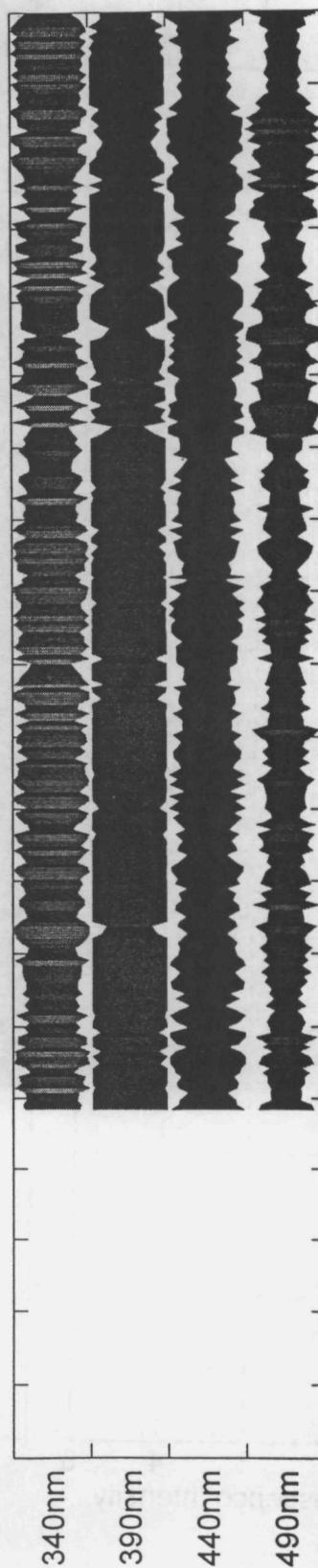
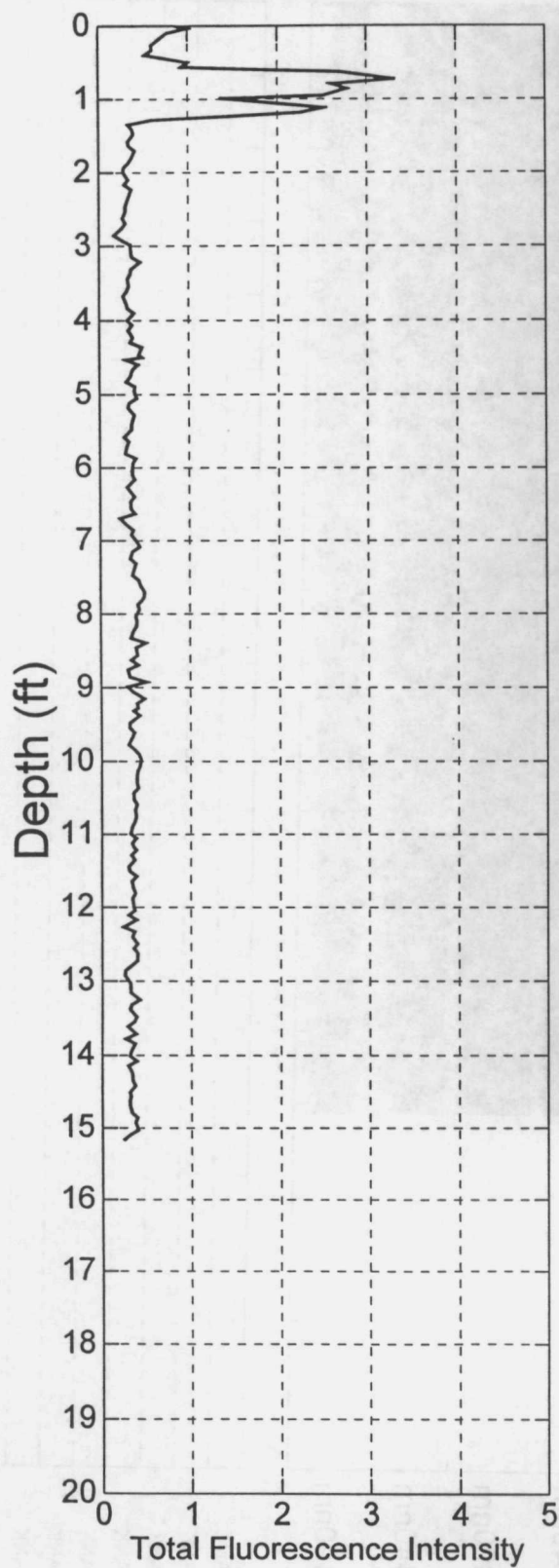
Job#: 0301-8077
Acquisition Date: 04-28-1998



CPT27

Measured LIF End Depth
15.16 ft
Measured Peak Fluorescence
3.321%

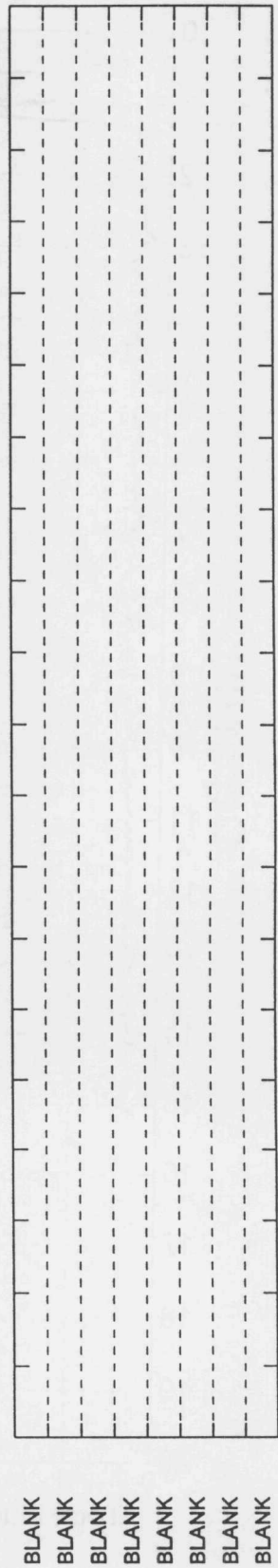
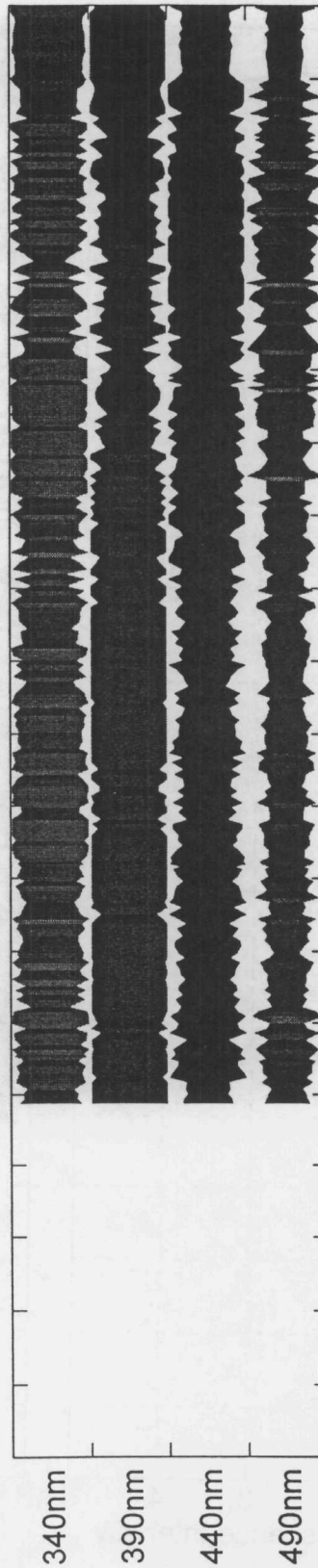
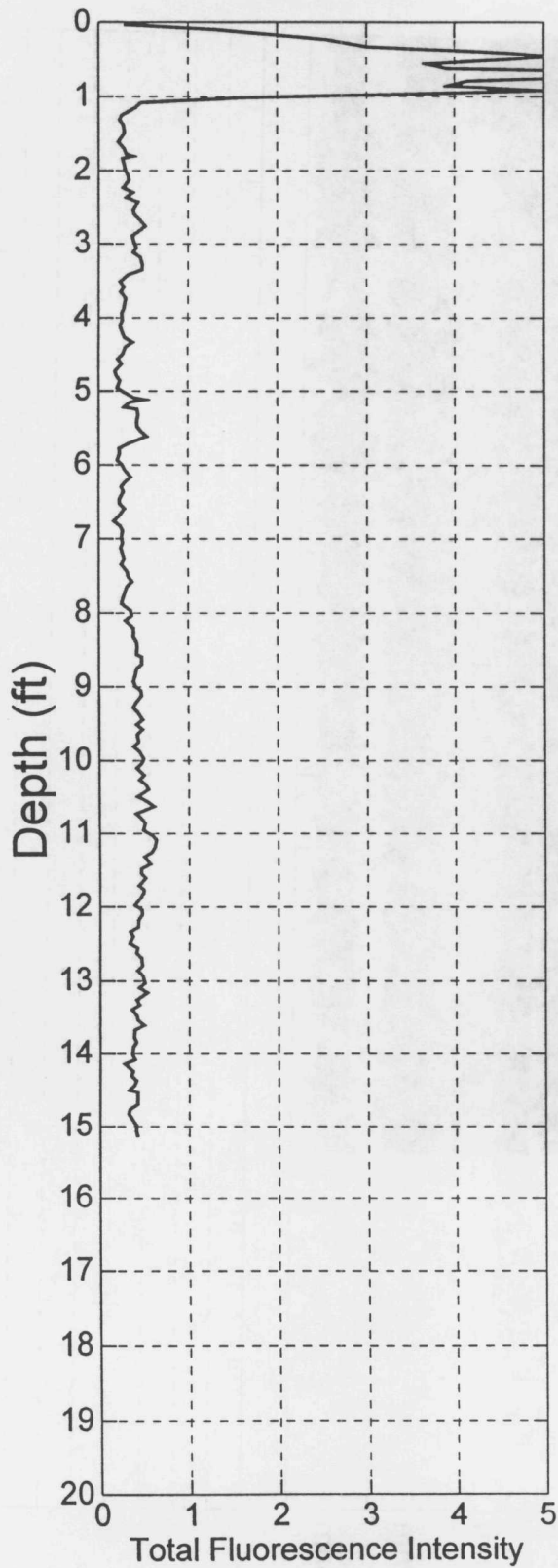
Job#: 0301-8077
Acquisition Date: 04-28-1998



CPT28

Measured LIF End Depth
15.12 ft
Measured Peak Fluorescence
7.007%

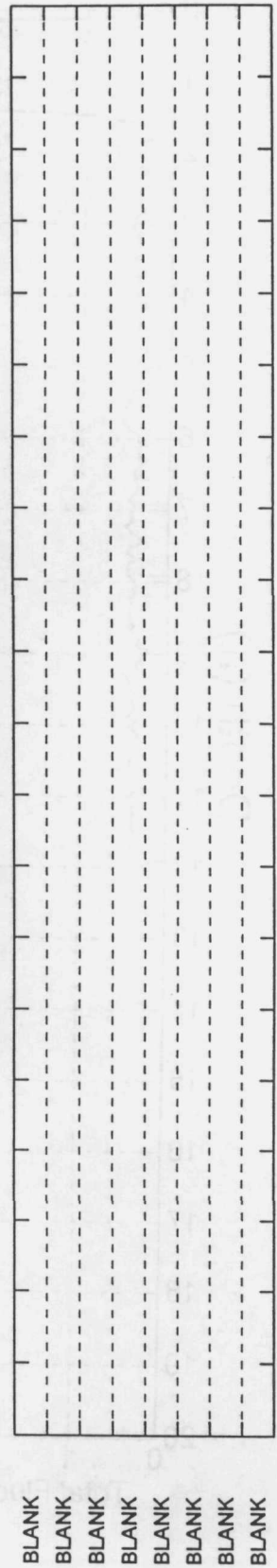
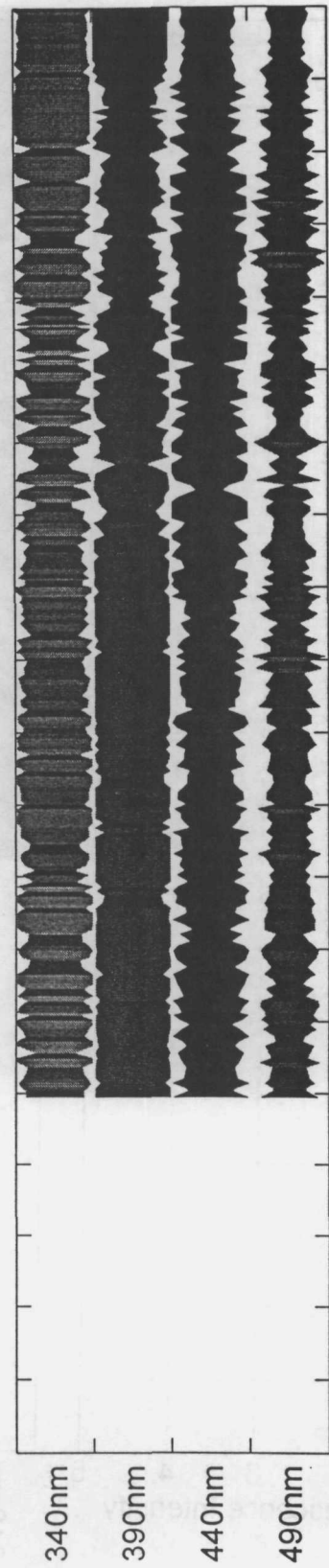
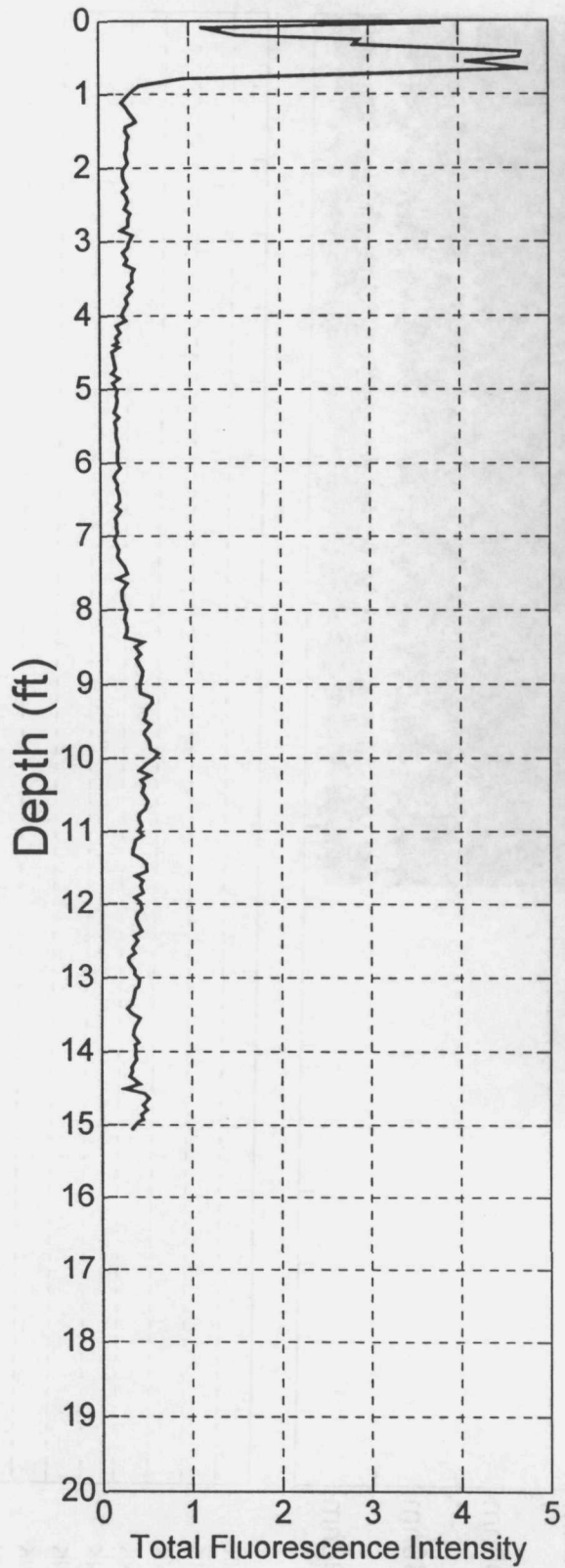
Job#: 0301-8077
Acquisition Date: 04-28-1998



CPT29

Measured LIF End Depth
15.06 ft
Measured Peak Fluorescence
4.772%

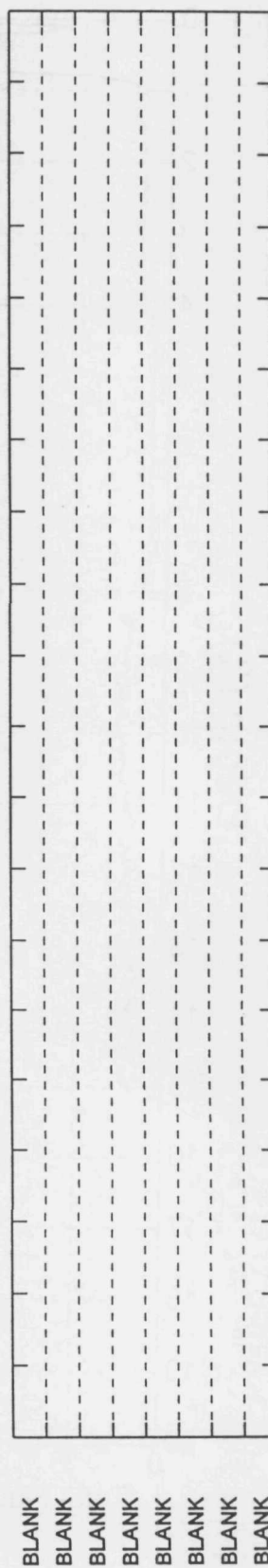
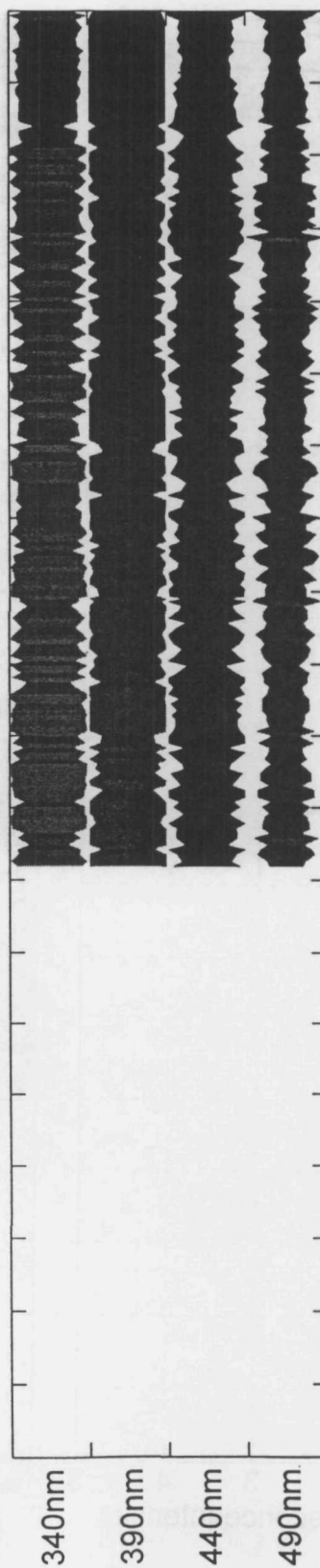
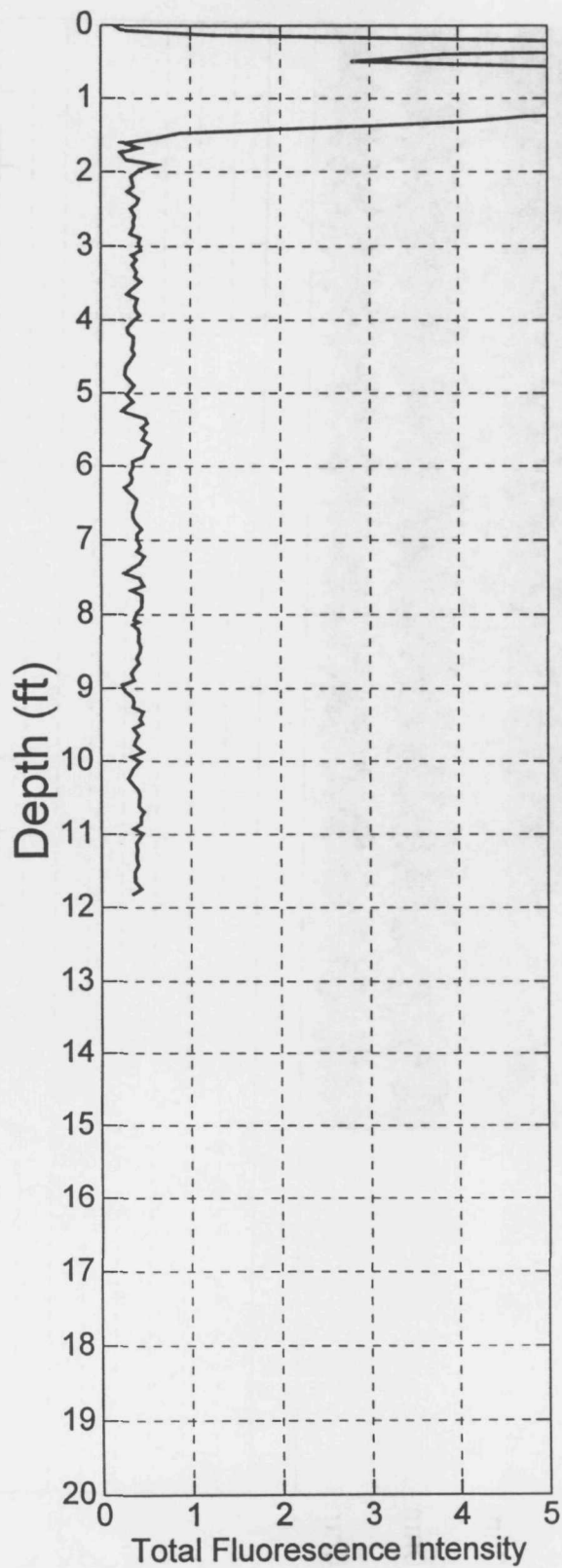
Job#: 0301-8077
Acquisition Date: 04-28-1998



CPT30

Measured LIF End Depth
11.81 ft
Measured Peak Fluorescence
14.57%

Job#: 0301-8077
Acquisition Date: 04-28-1998



CPT31

Measured LIF End Depth

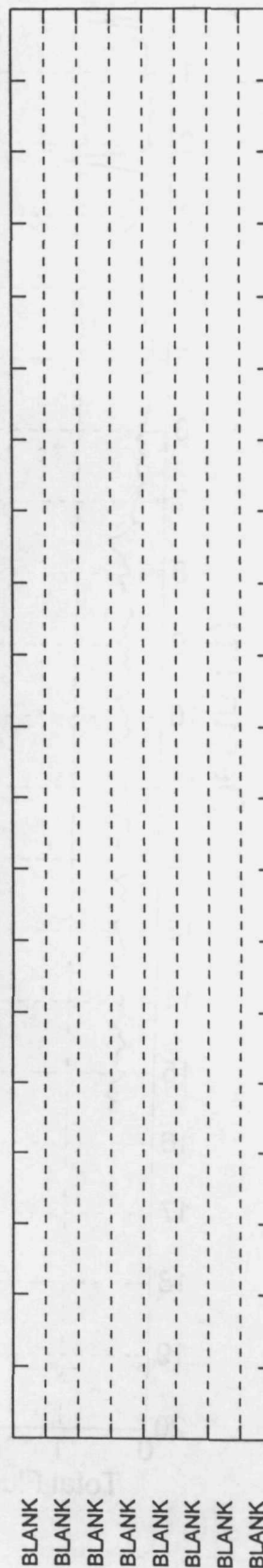
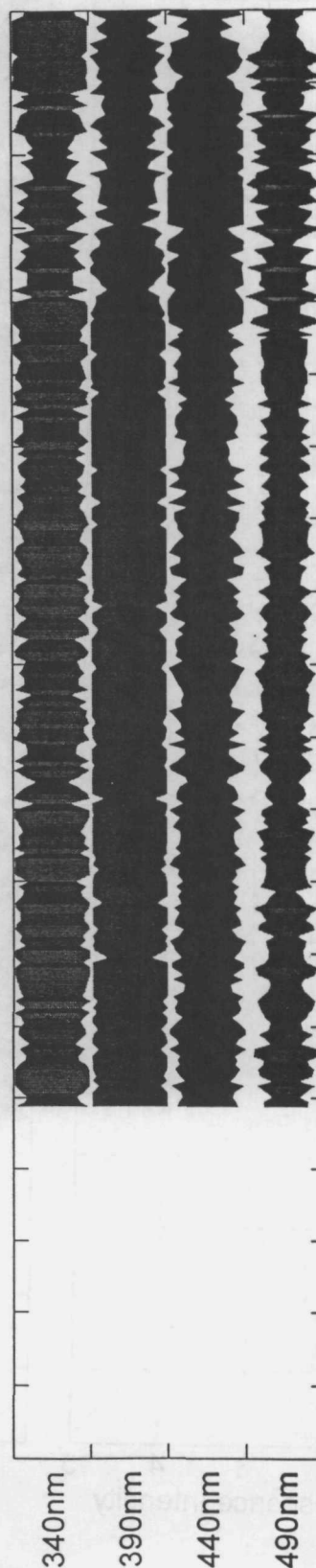
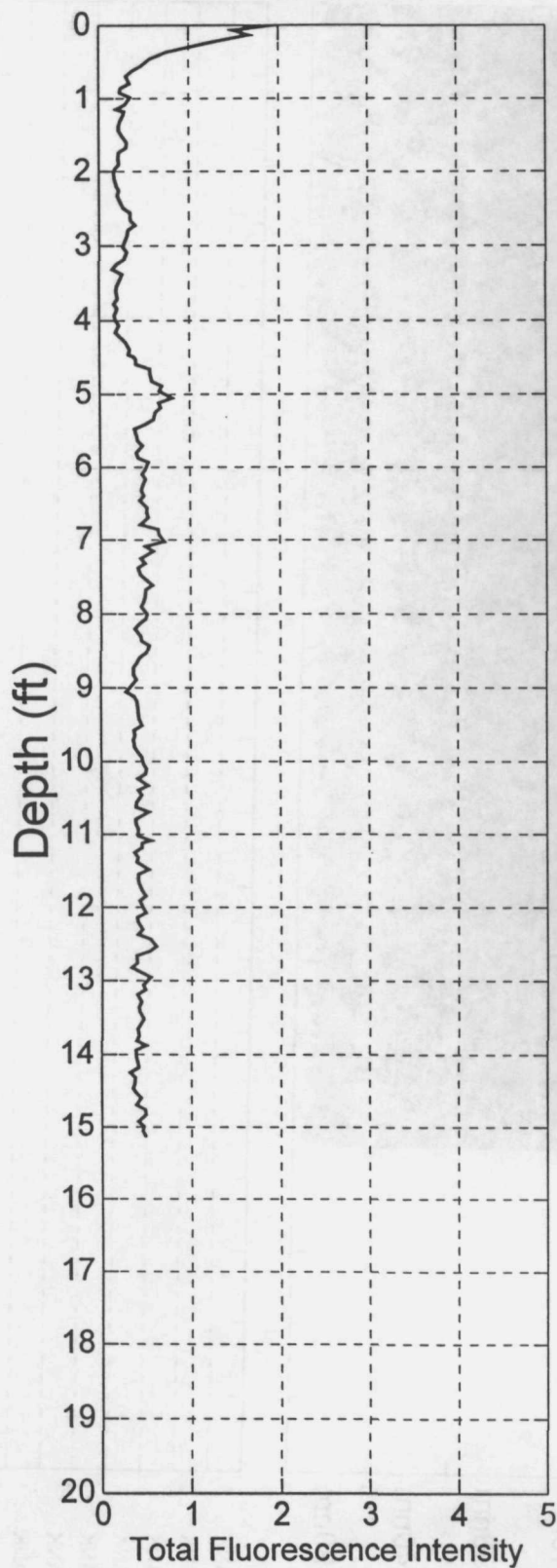
15.12 ft

Measured Peak Fluorescence

1.665%

Job#: 0301-8077

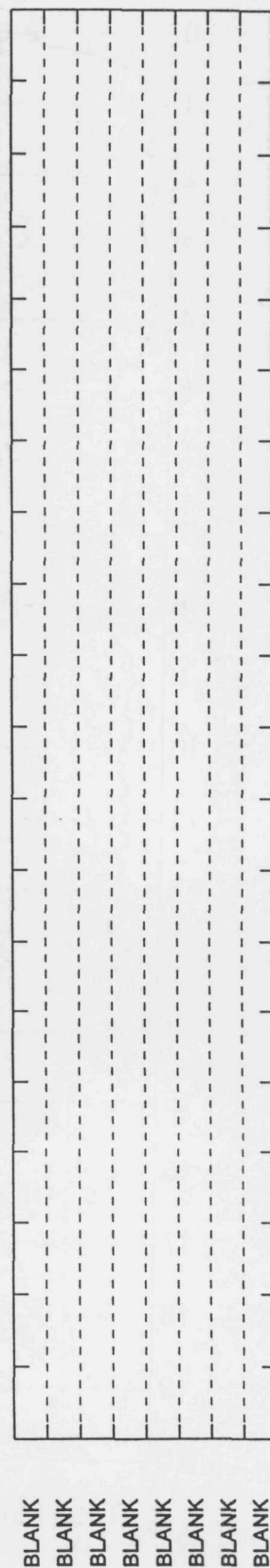
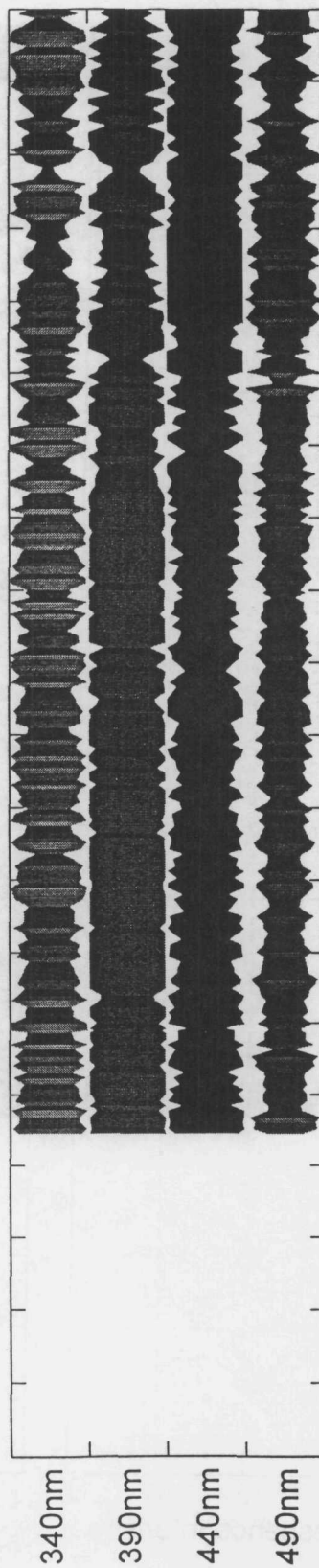
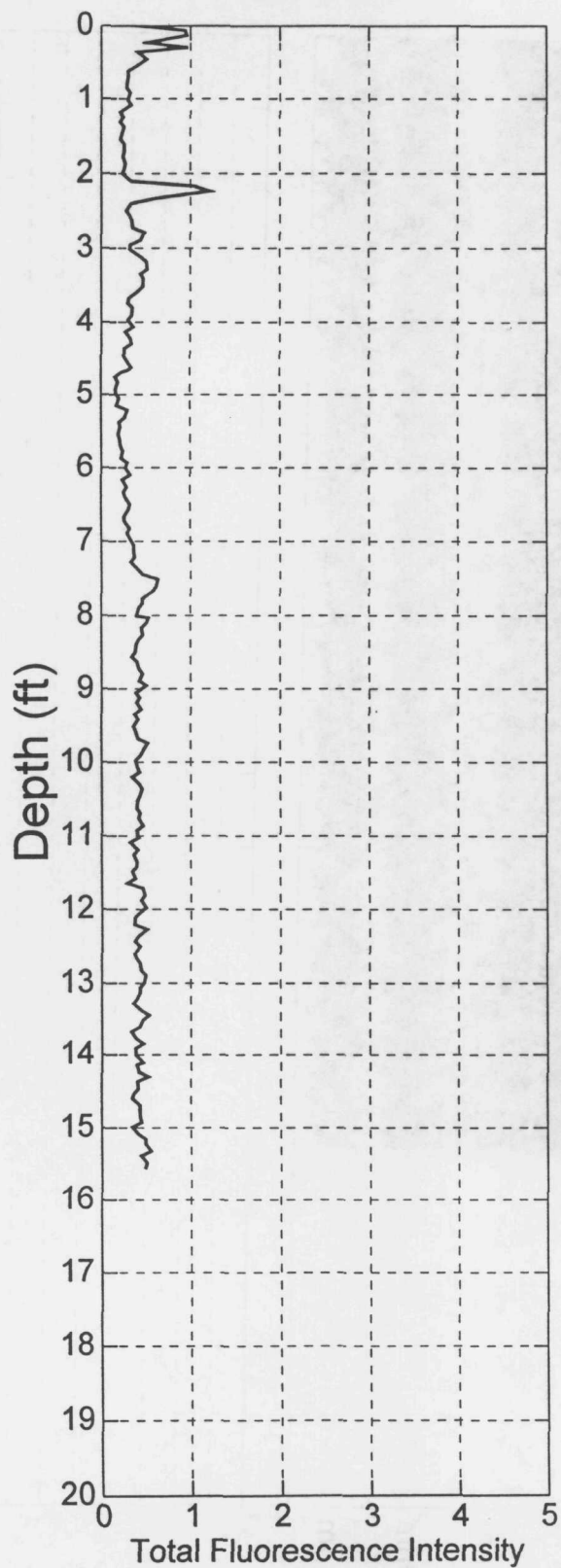
Acquisition Date: 04-28-1998



CPT32

Measured LIF End Depth
15.55 ft
Measured Peak Fluorescence
1.207%

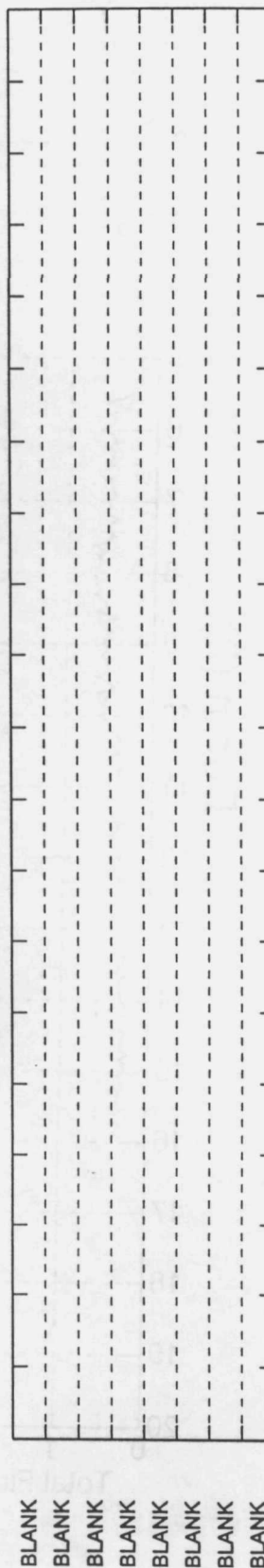
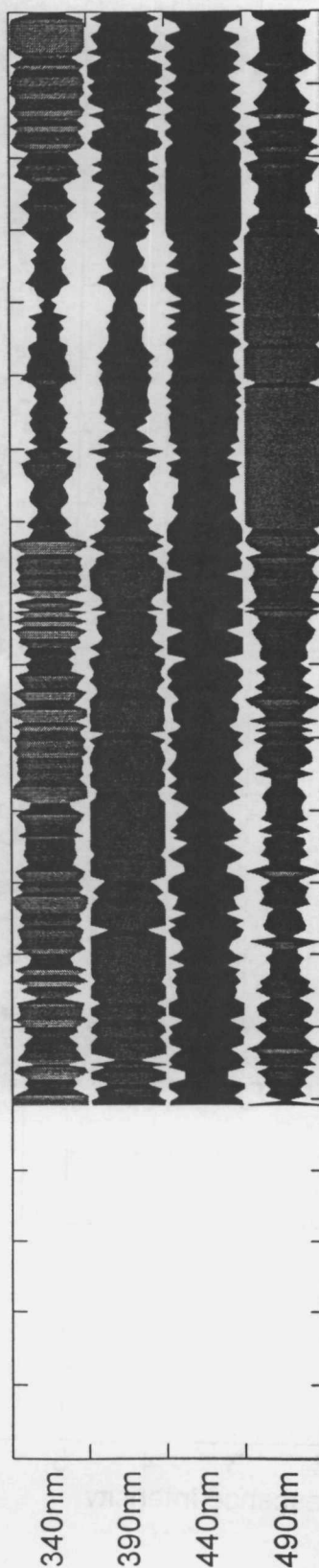
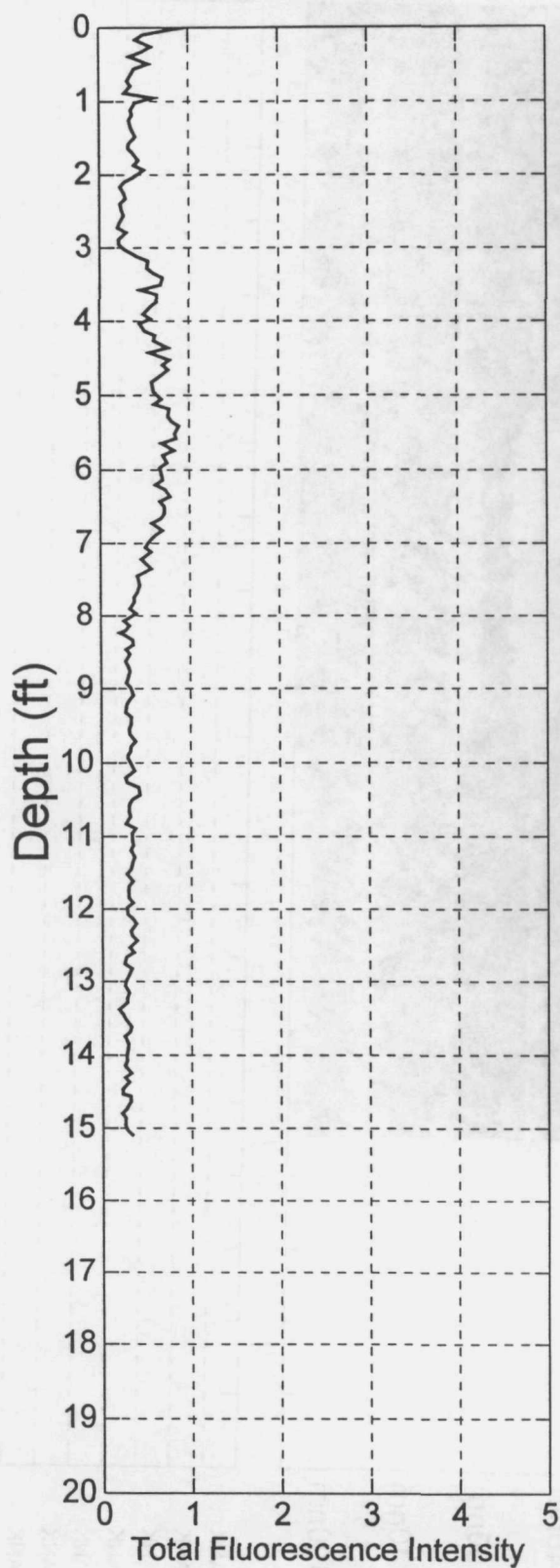
Job#: 0301-8077
Acquisition Date: 04-29-1998



CPT33

Measured LIF End Depth
15.09 ft
Measured Peak Fluorescence
0.8804%

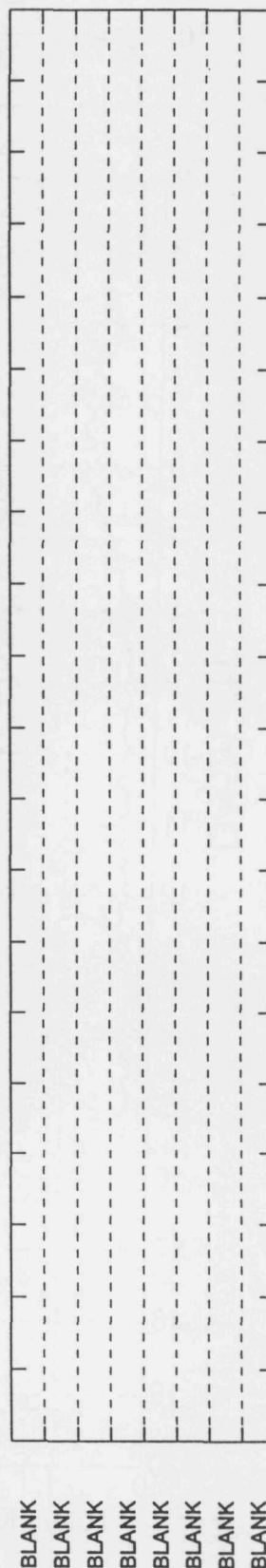
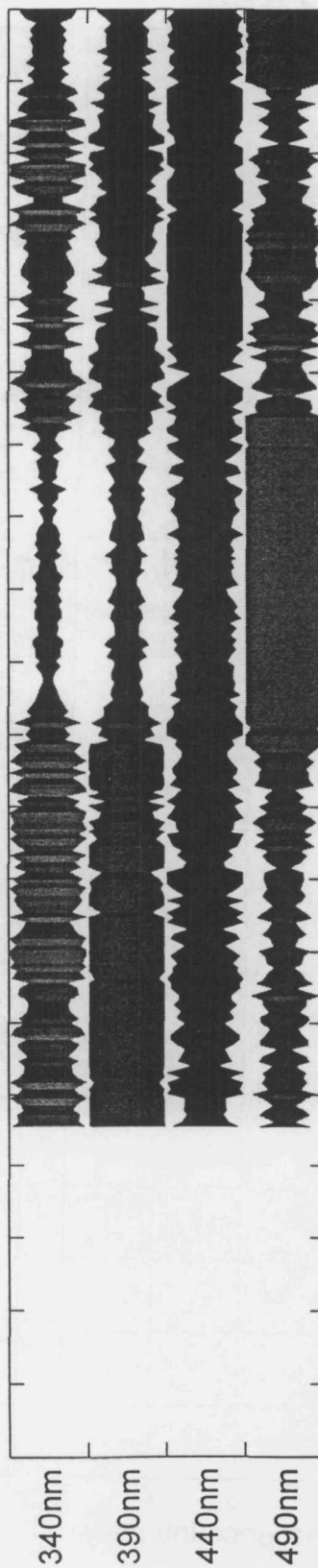
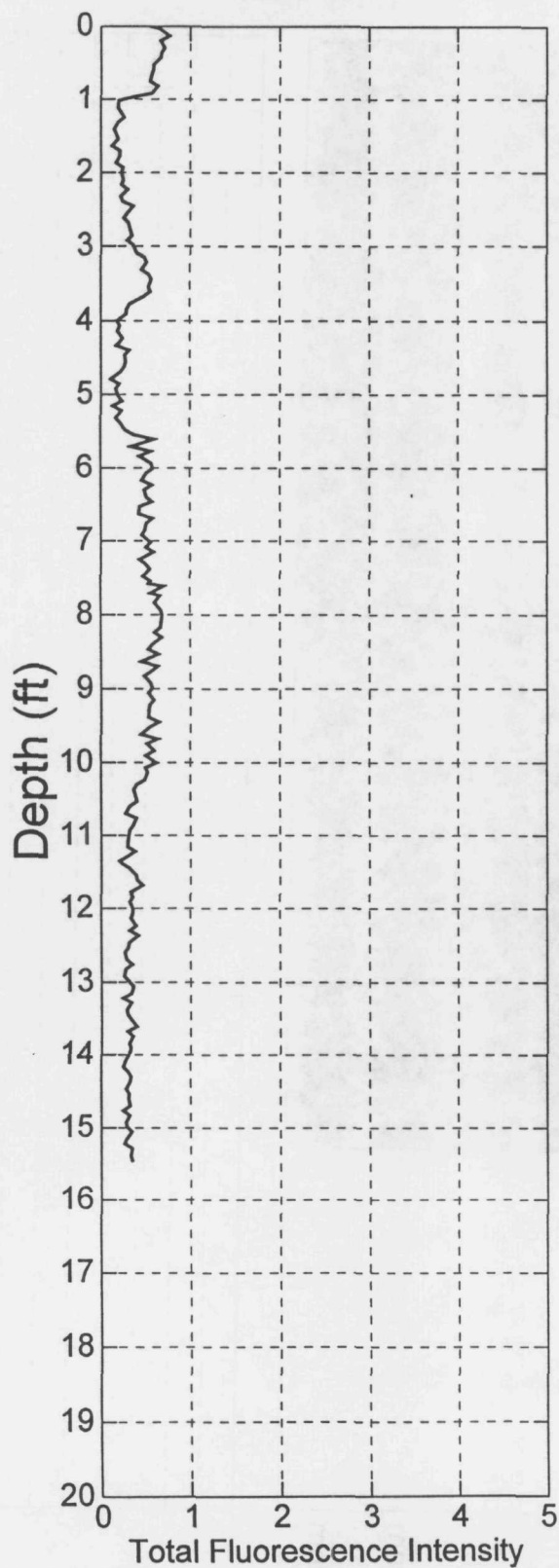
Job#: 0301-8077
Acquisition Date: 04-29-1998



CPT34

Measured LIF End Depth
15.45 ft
Measured Peak Fluorescence
0.7646%

Job#: 0301-8077
Acquisition Date: 04-29-1998



CPT35

Measured LIF End Depth

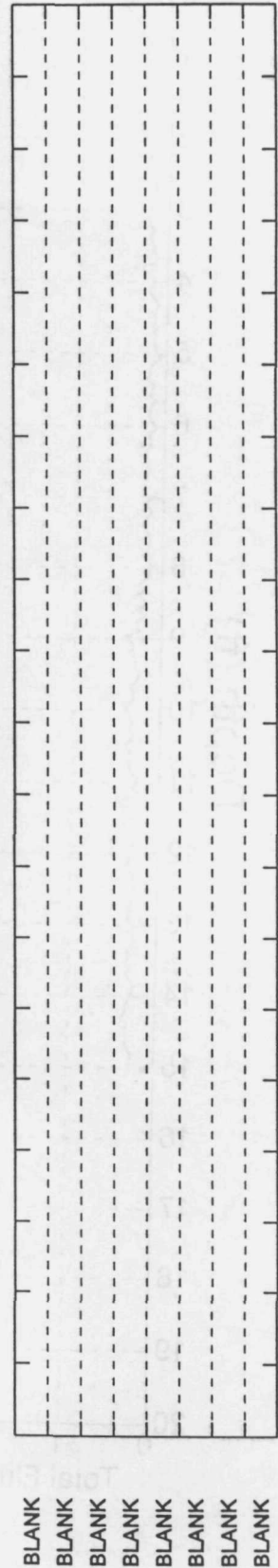
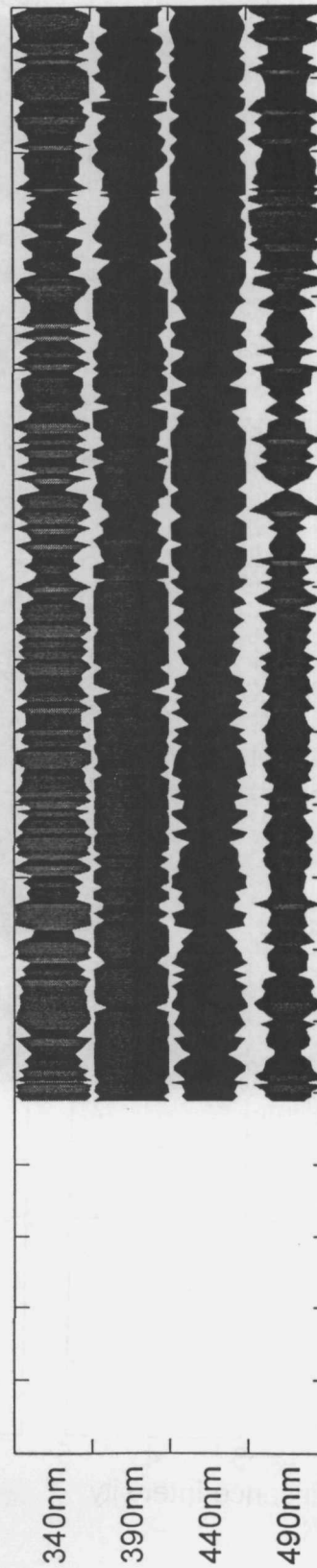
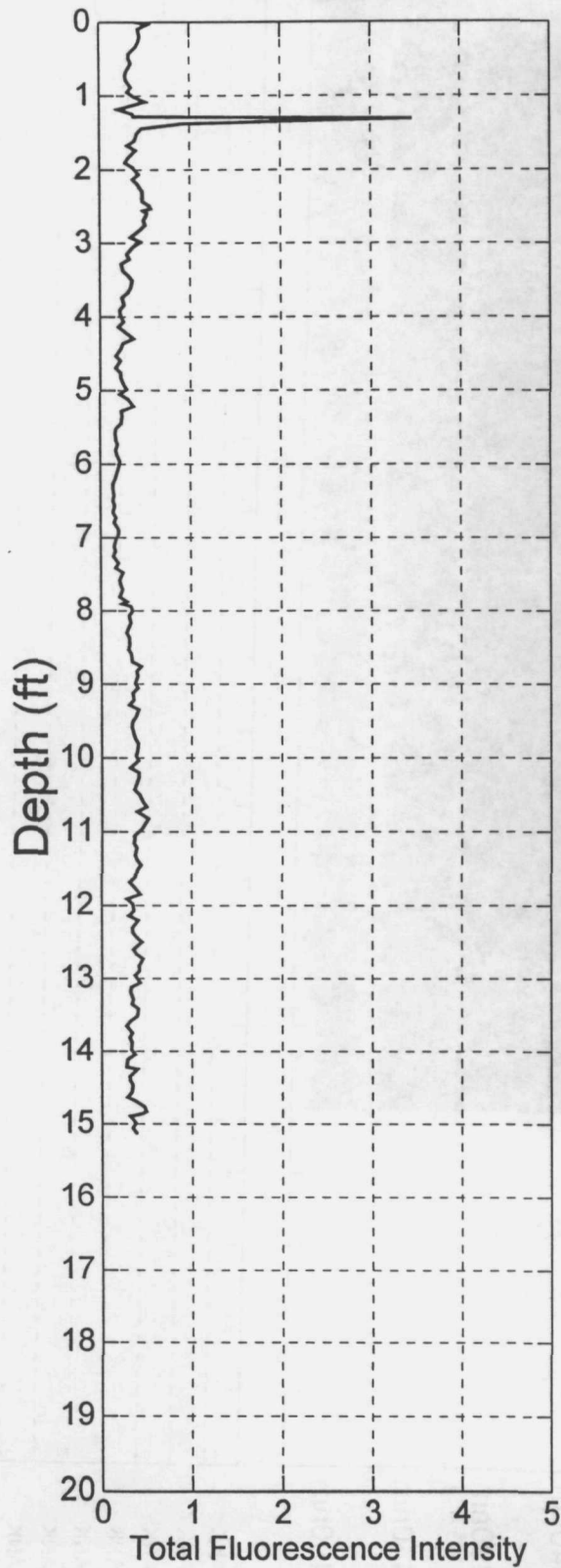
15.12 ft

Measured Peak Fluorescence

3.461%

Job#: 0301-8077

Acquisition Date: 04-29-1998



CPT36

Measured LIF End Depth

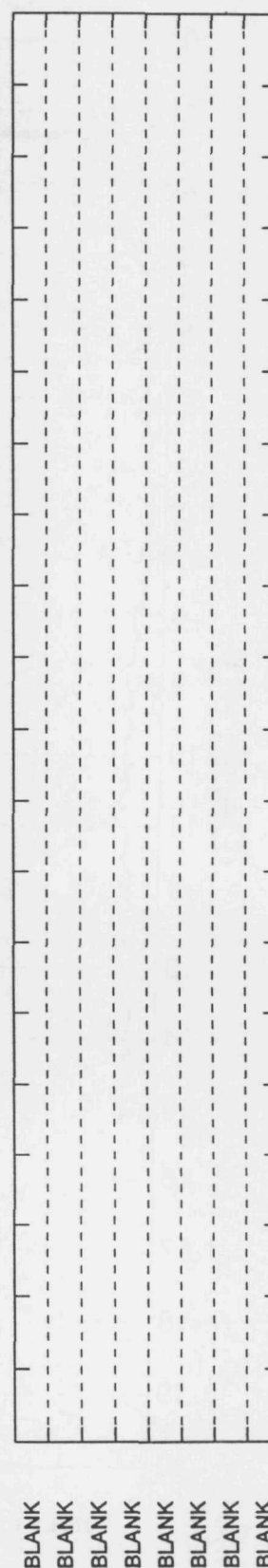
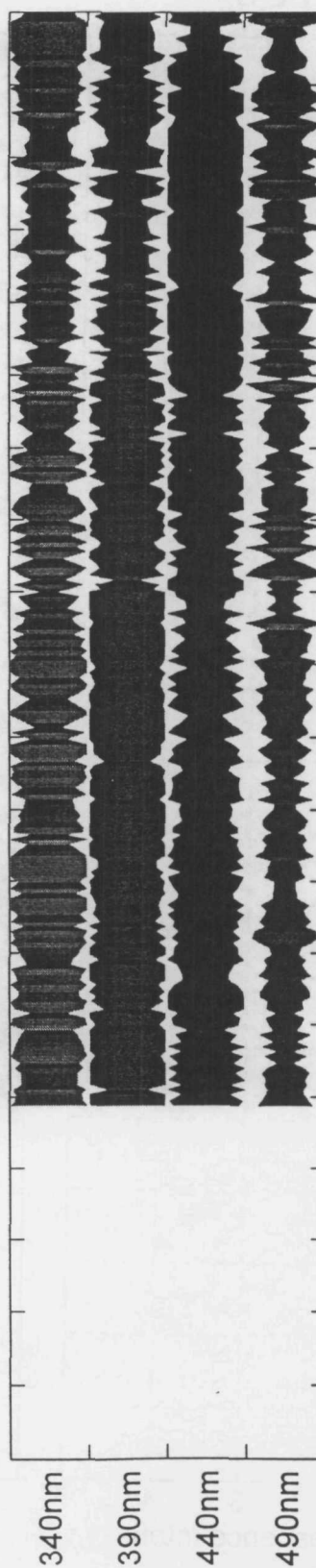
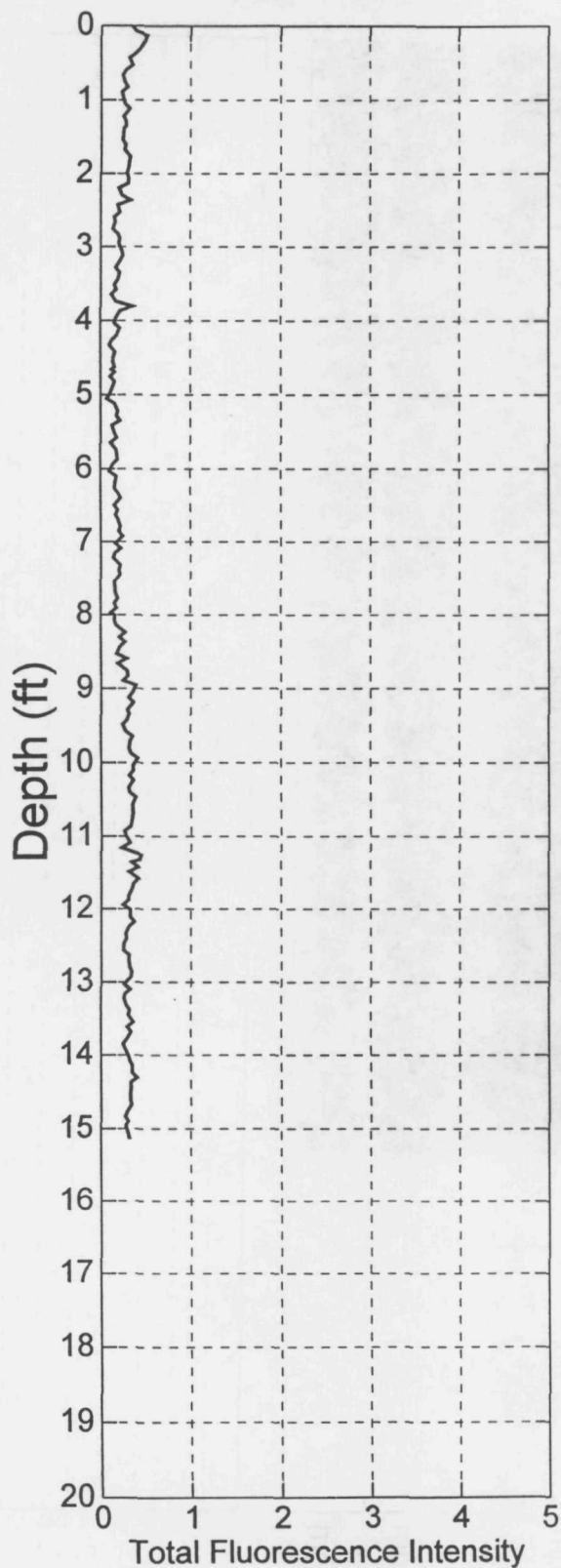
15.12 ft

Measured Peak Fluorescence

0.5148%

Job#: 0301-8077

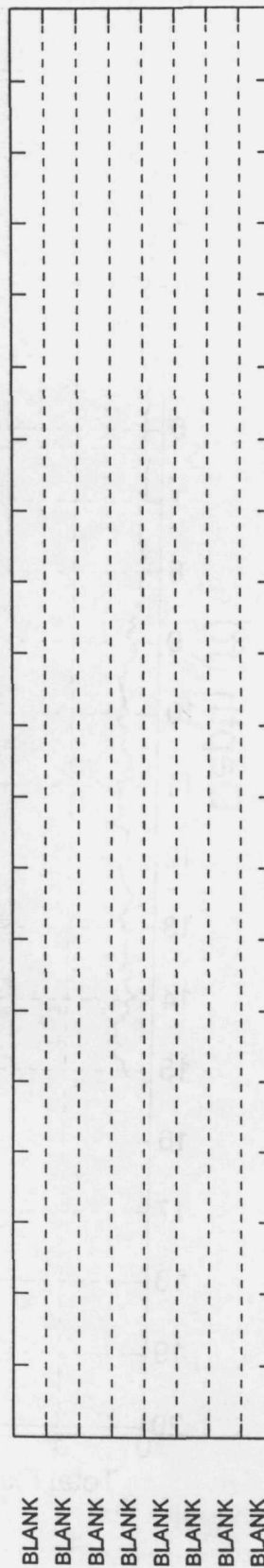
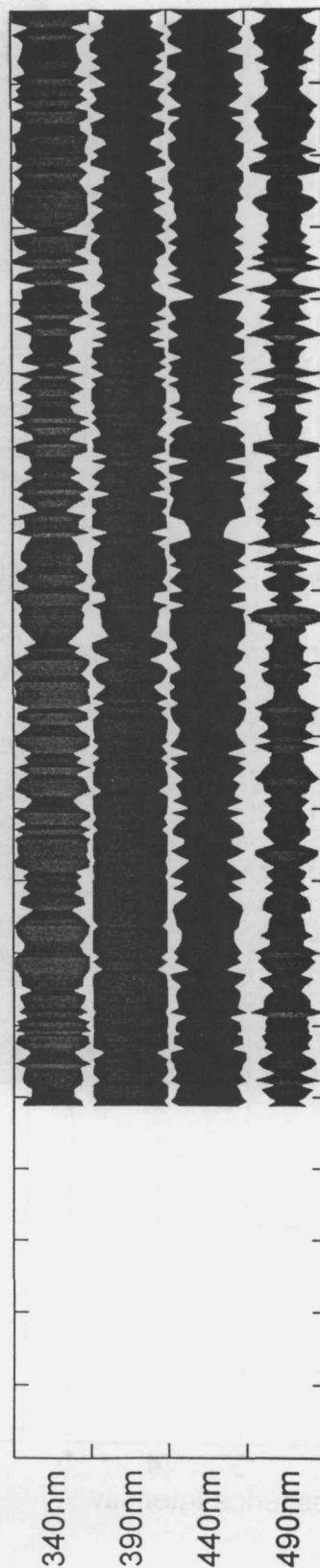
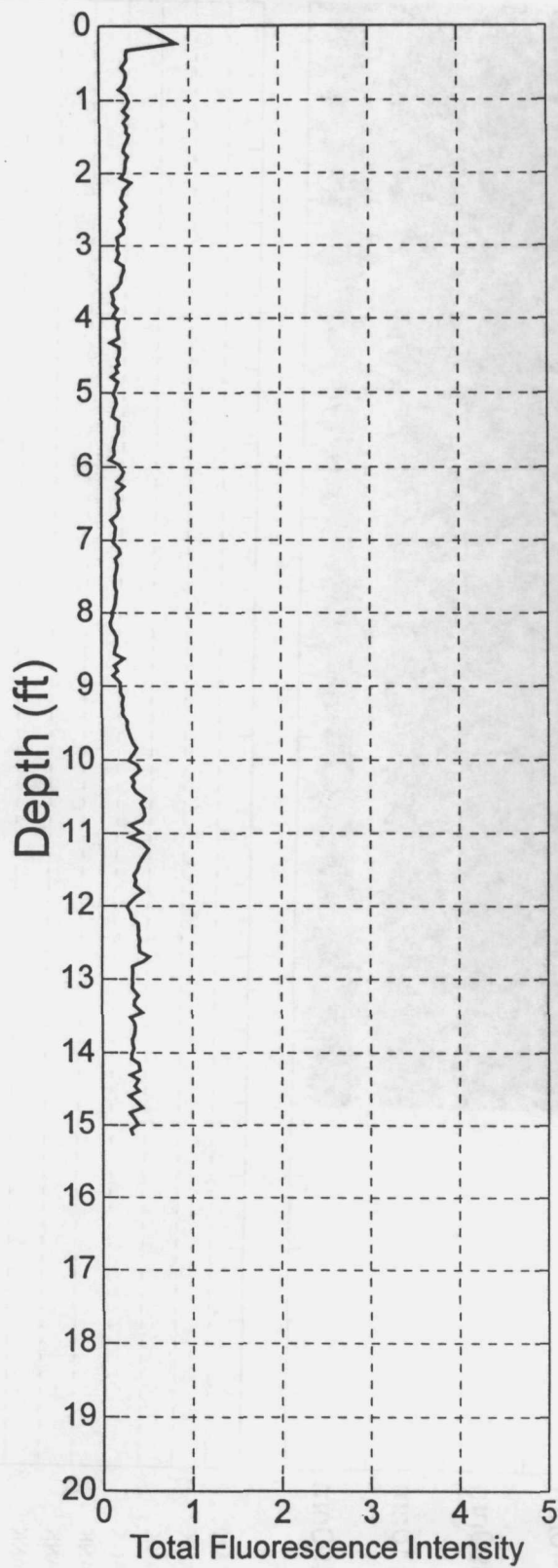
Acquisition Date: 04-29-1998



CPT37

Measured LIF End Depth
15.12 ft
Measured Peak Fluorescence
0.8505%

Job#: 0301-8077
Acquisition Date: 04-29-1998



CPT38

Measured LIF End Depth

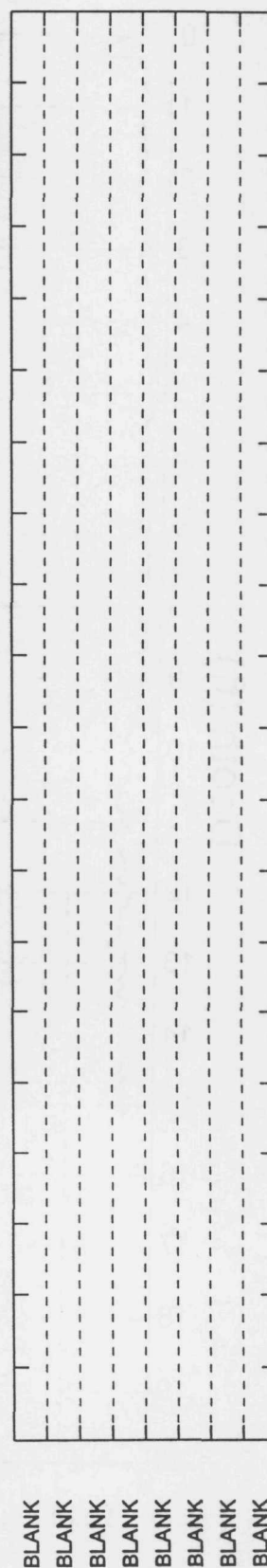
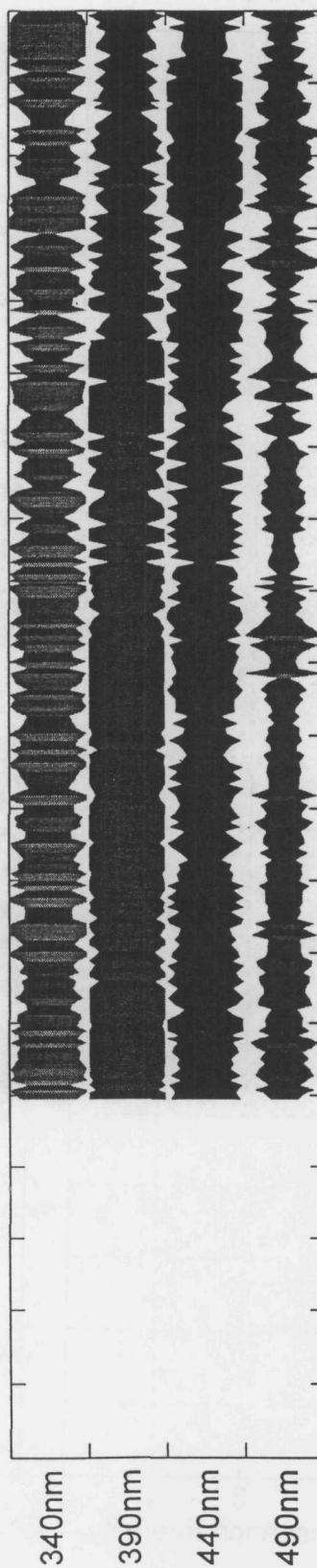
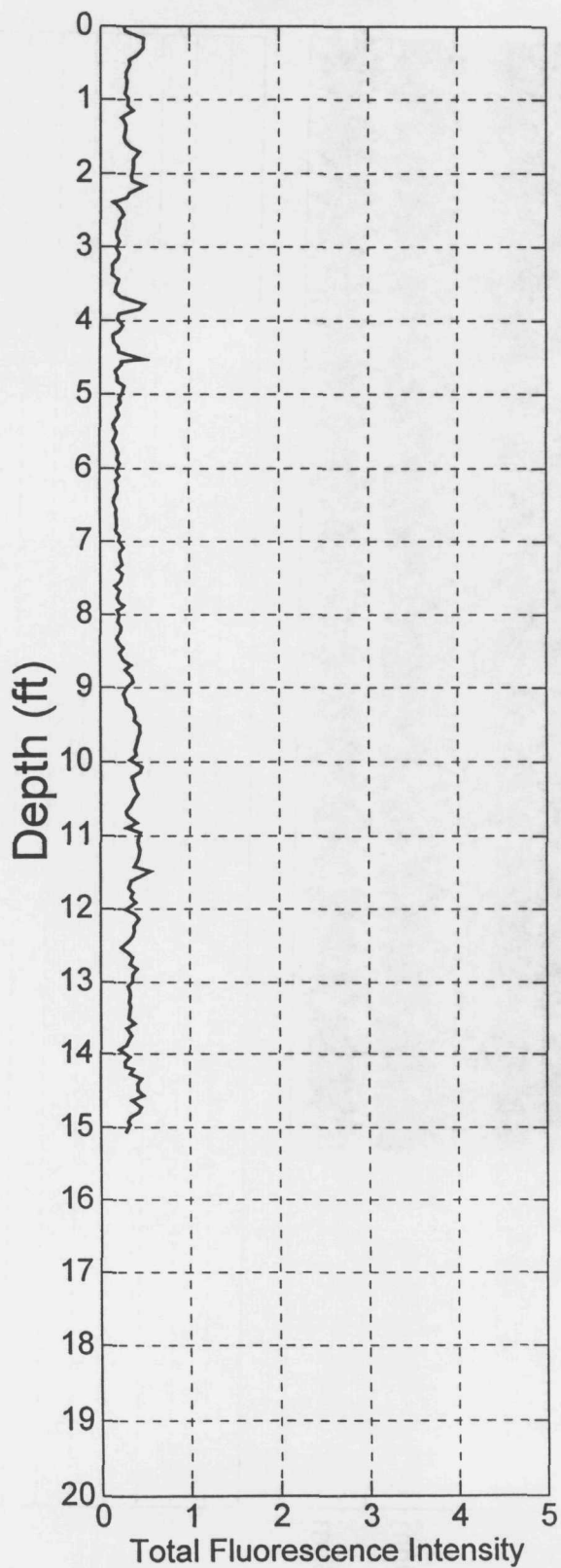
15.06 ft

Measured Peak Fluorescence

0.5559%

Job#: 0301-8077

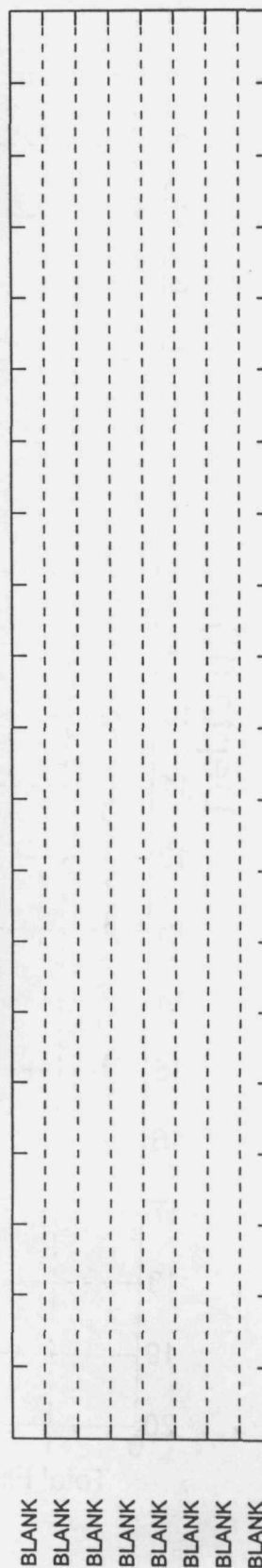
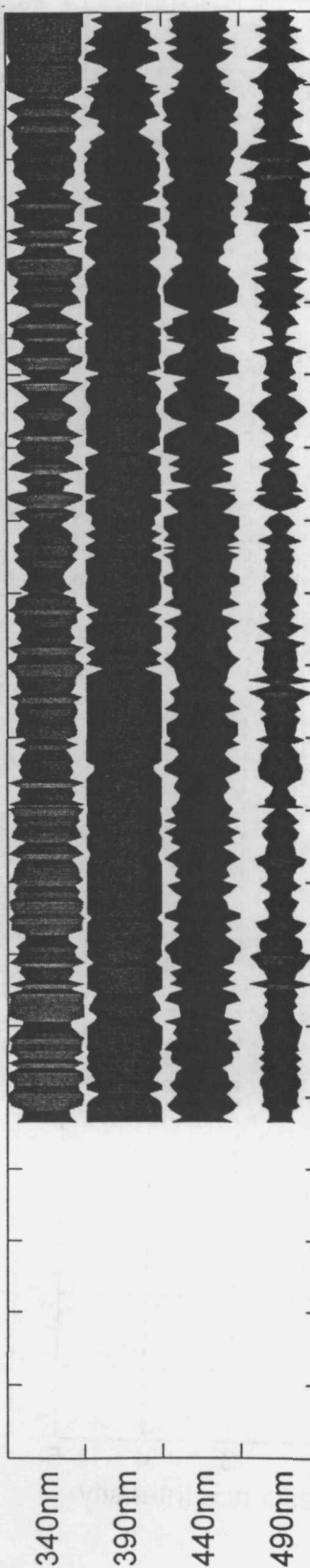
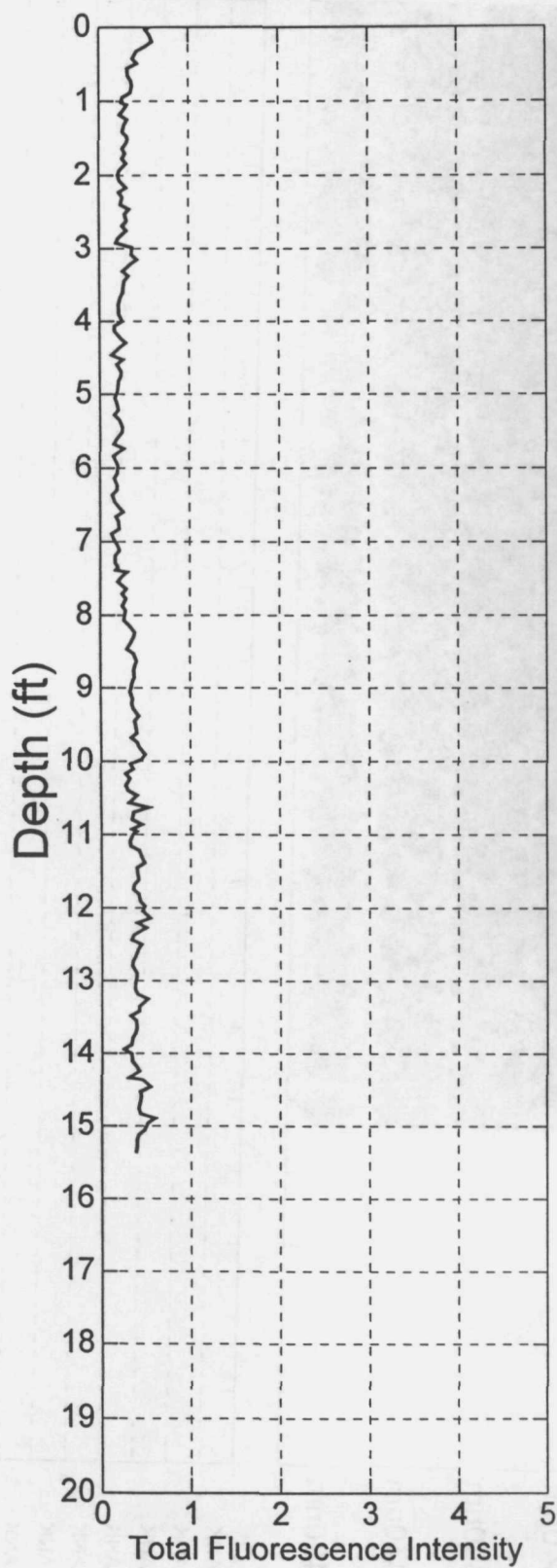
Acquisition Date: 04-29-1998



CPT39

Measured LIF End Depth
15.35 ft
Measured Peak Fluorescence
0.5977%

Job#: 0301-8077
Acquisition Date: 04-29-1998



CPT40

Measured LIF End Depth

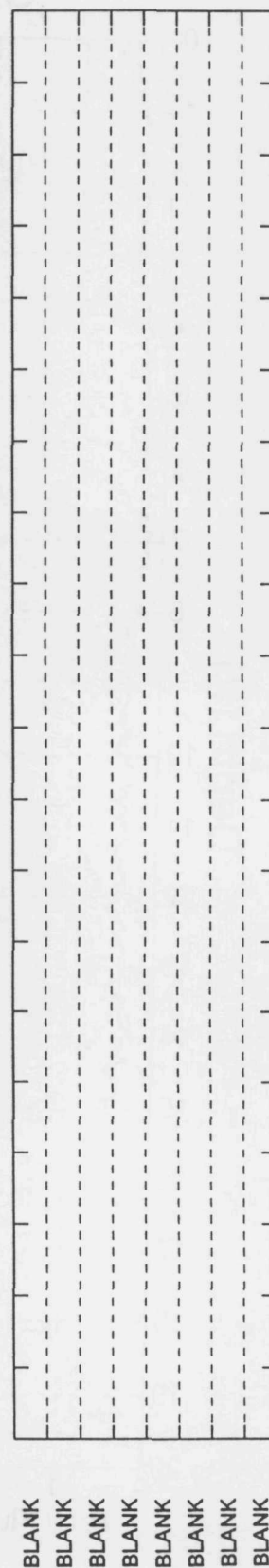
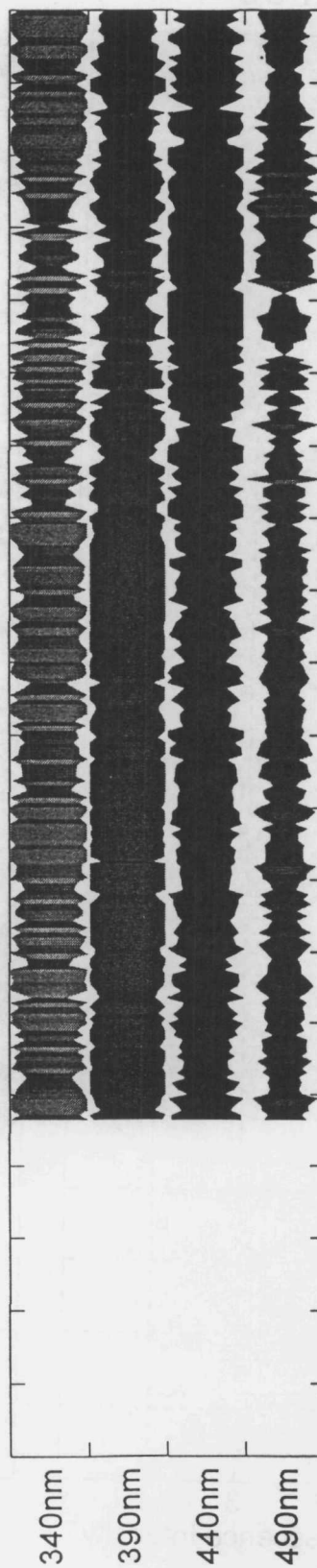
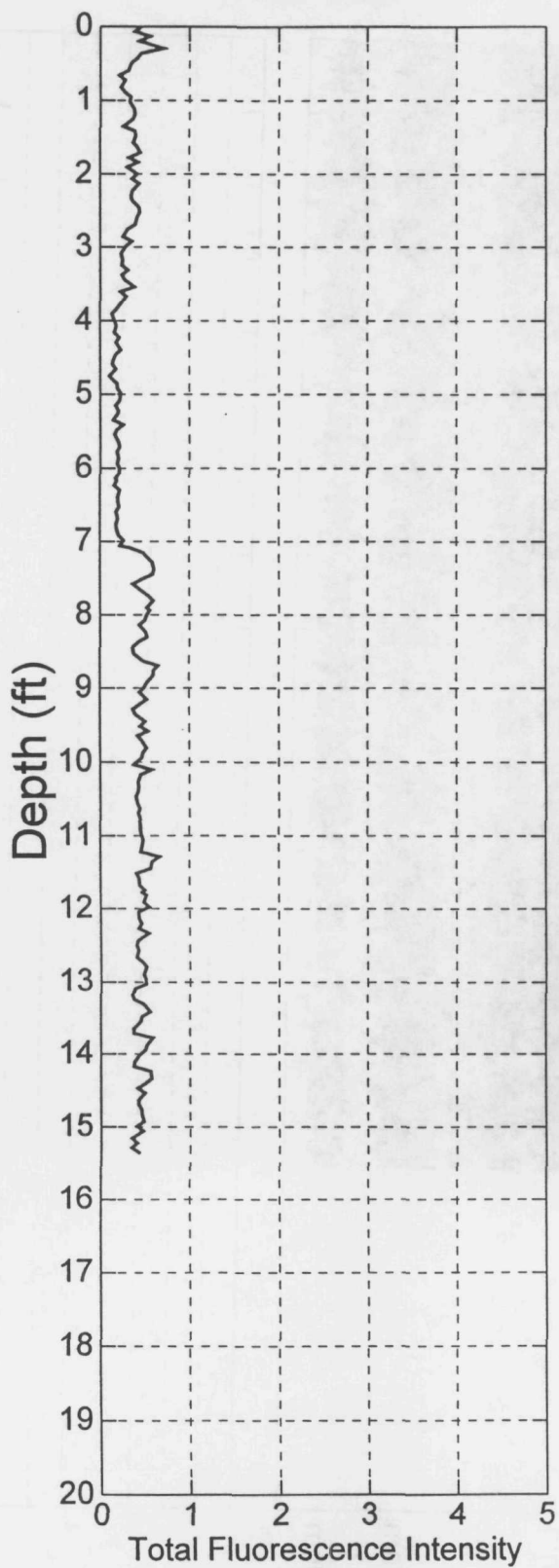
15.35 ft

Measured Peak Fluorescence

0.7013%

Job#: 0301-8077

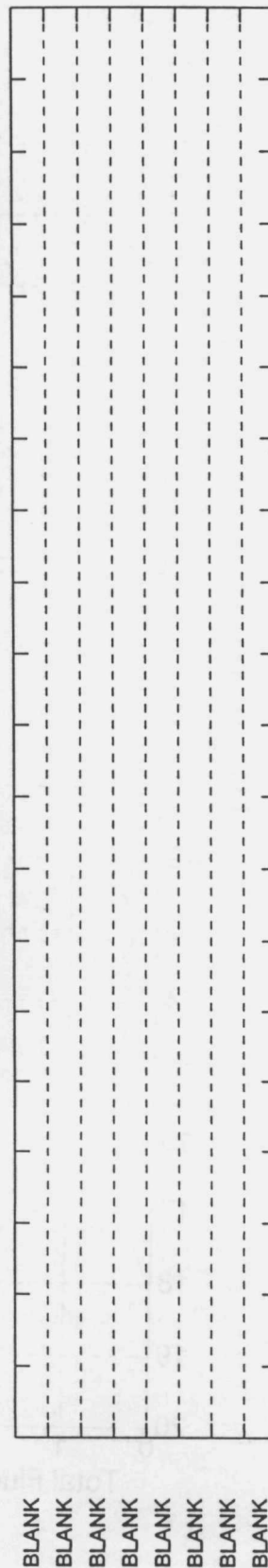
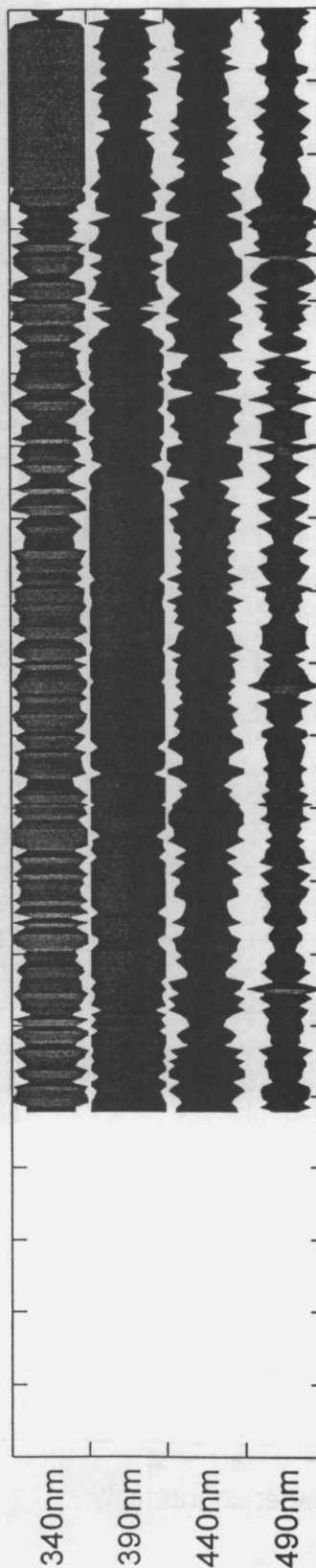
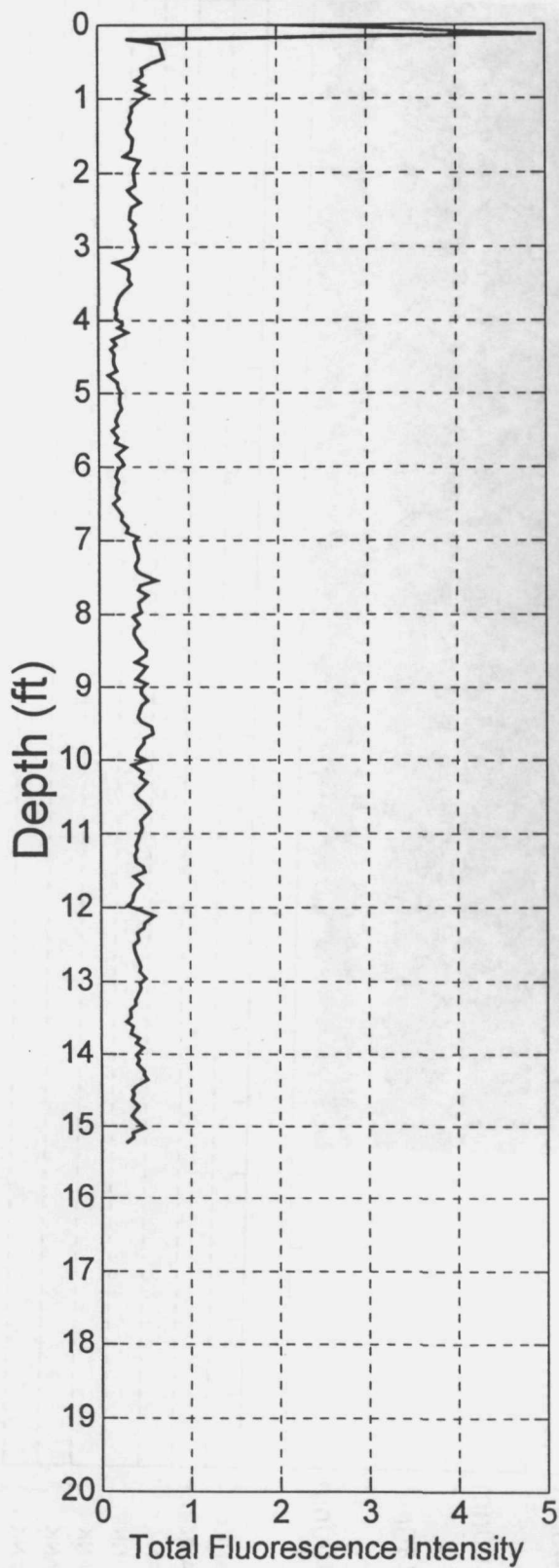
Acquisition Date: 04-29-1998



CPT41

Measured LIF End Depth
15.22 ft
Measured Peak Fluorescence
4.905%

Job#: 0301-8077
Acquisition Date: 04-29-1998



CPT42

Measured LIF End Depth

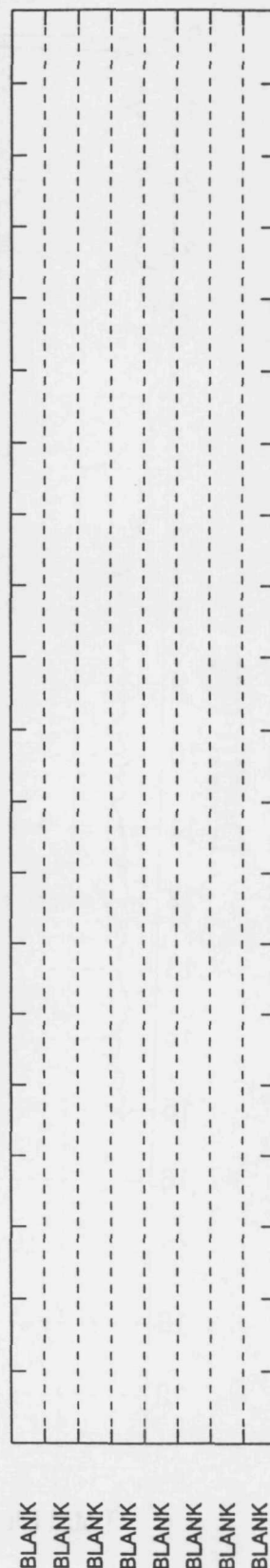
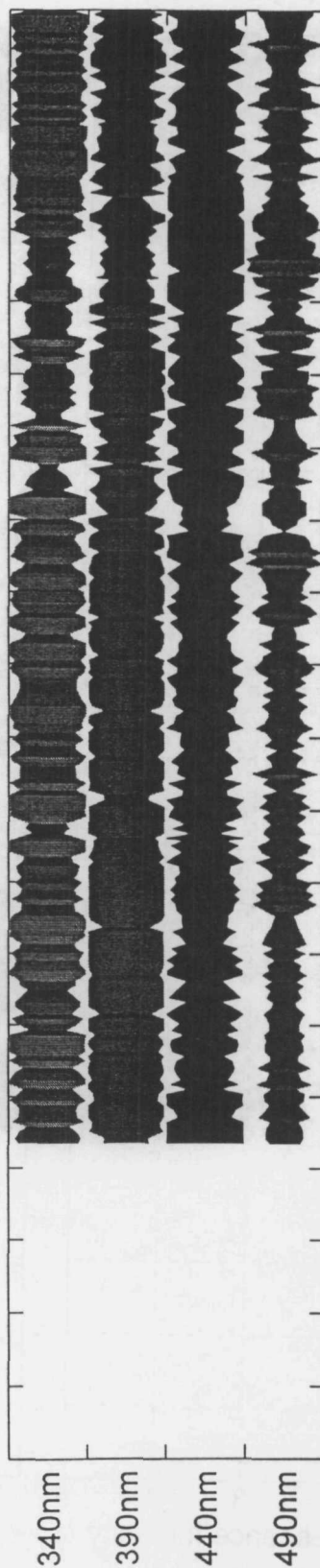
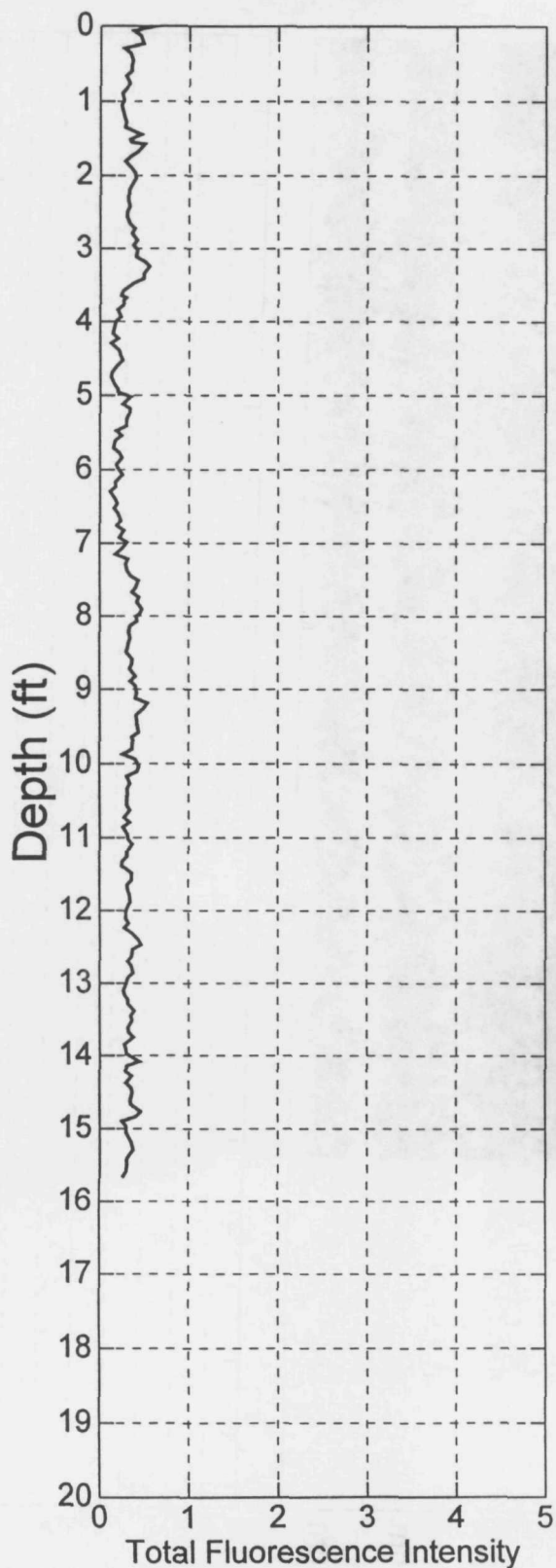
15.65 ft

Measured Peak Fluorescence

0.5529%

Job#: 0301-8077

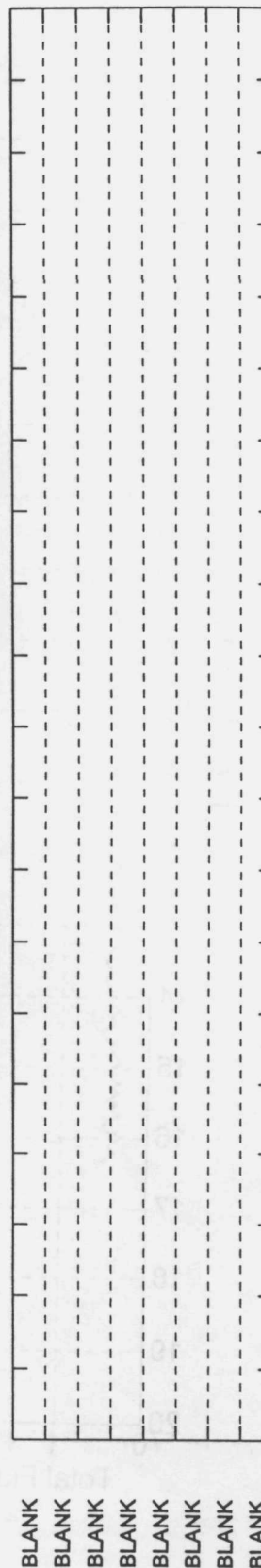
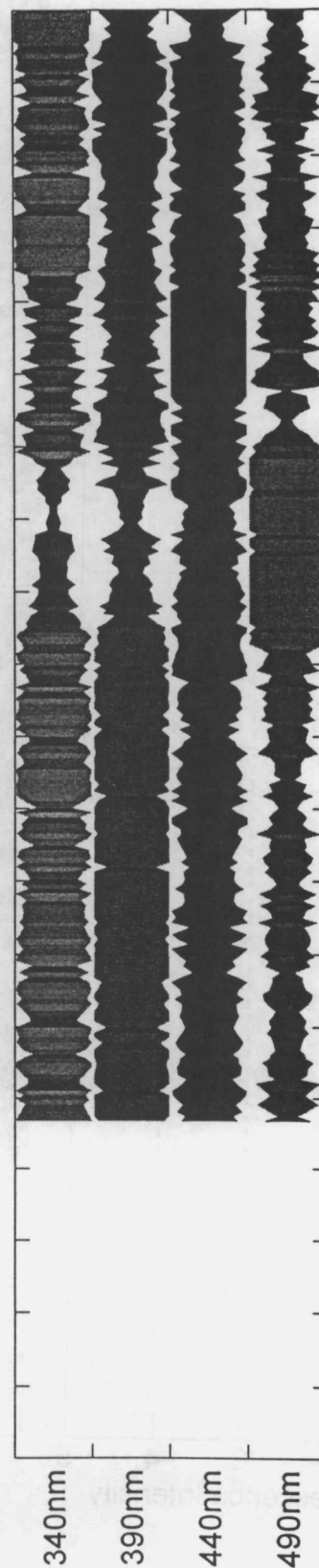
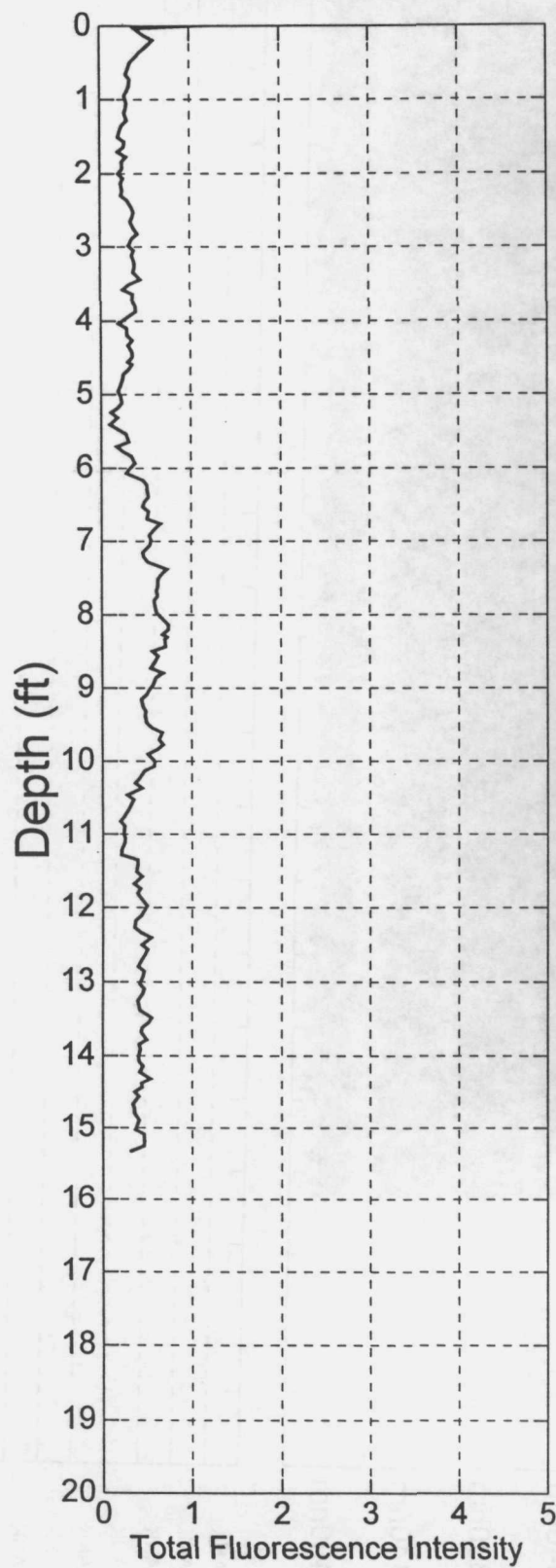
Acquisition Date: 04-29-1998



CPT43

Measured LIF End Depth
15.32 ft
Measured Peak Fluorescence
0.7404%

Job#: 0301-8077
Acquisition Date: 04-29-1998



CPT44

Measured LIF End Depth

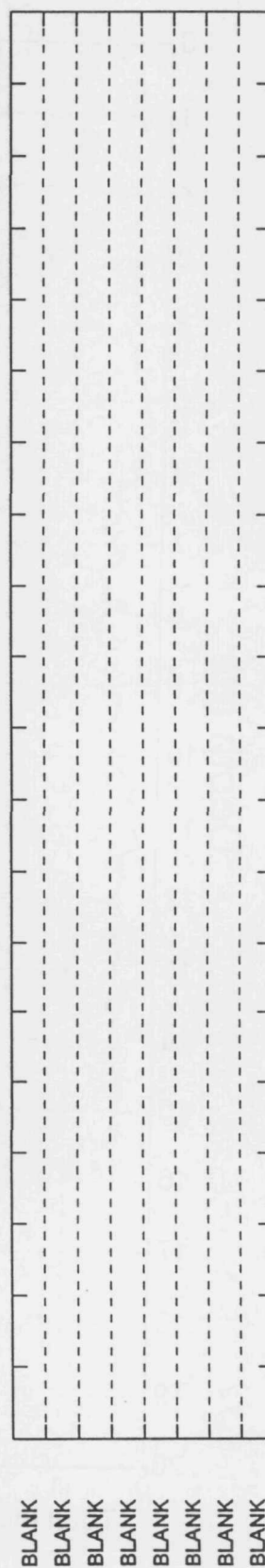
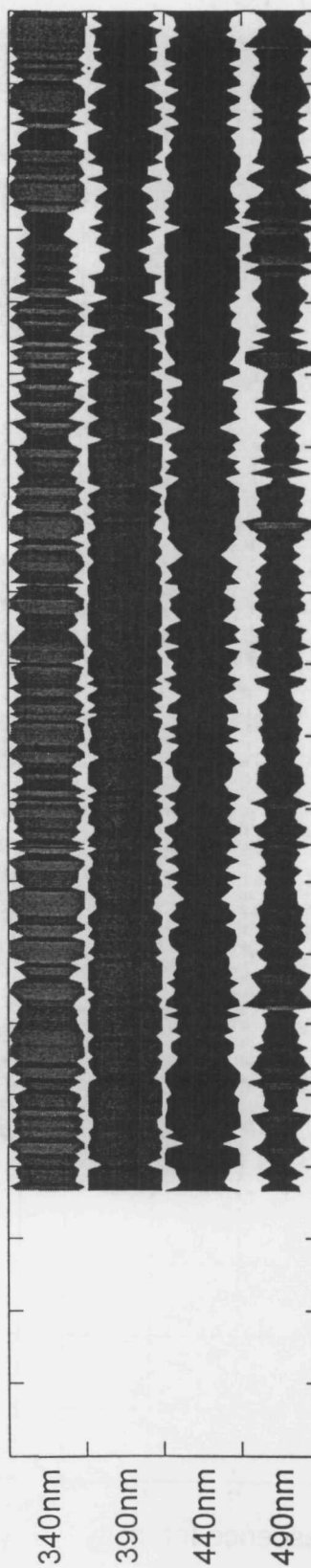
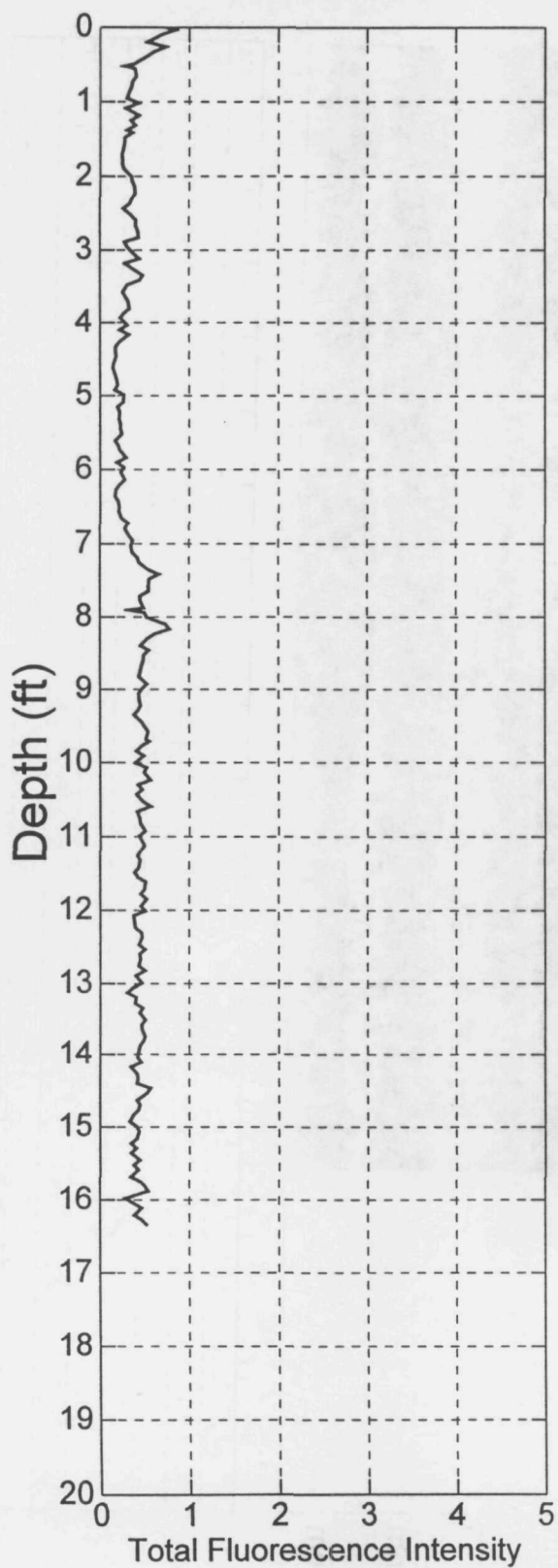
16.34 ft

Measured Peak Fluorescence

0.8363%

Job#: 0301-8077

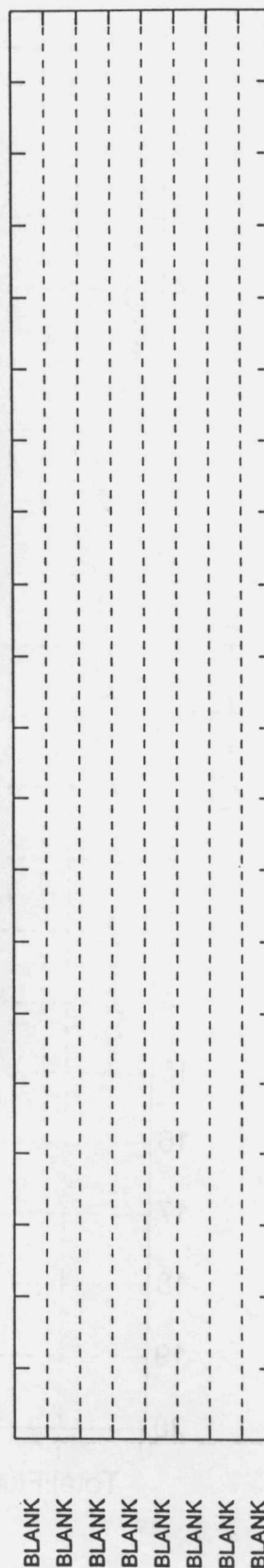
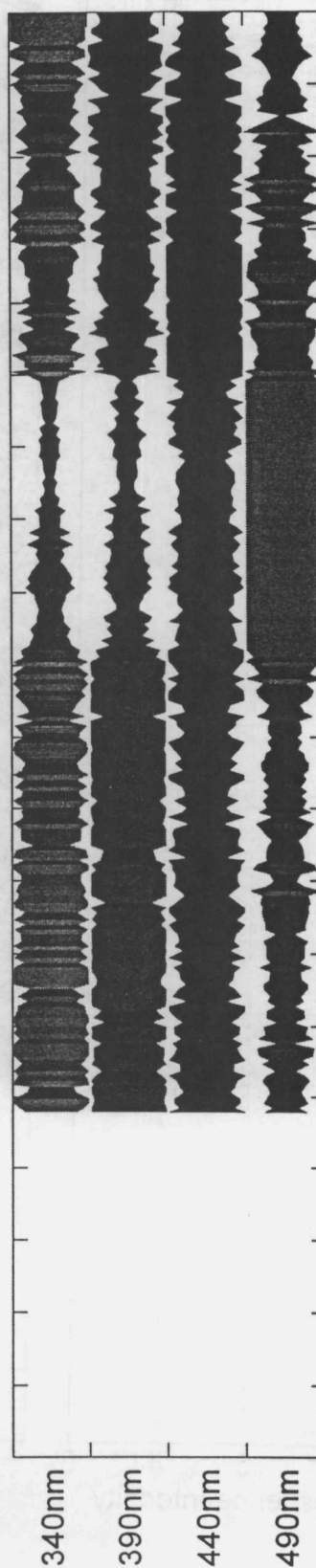
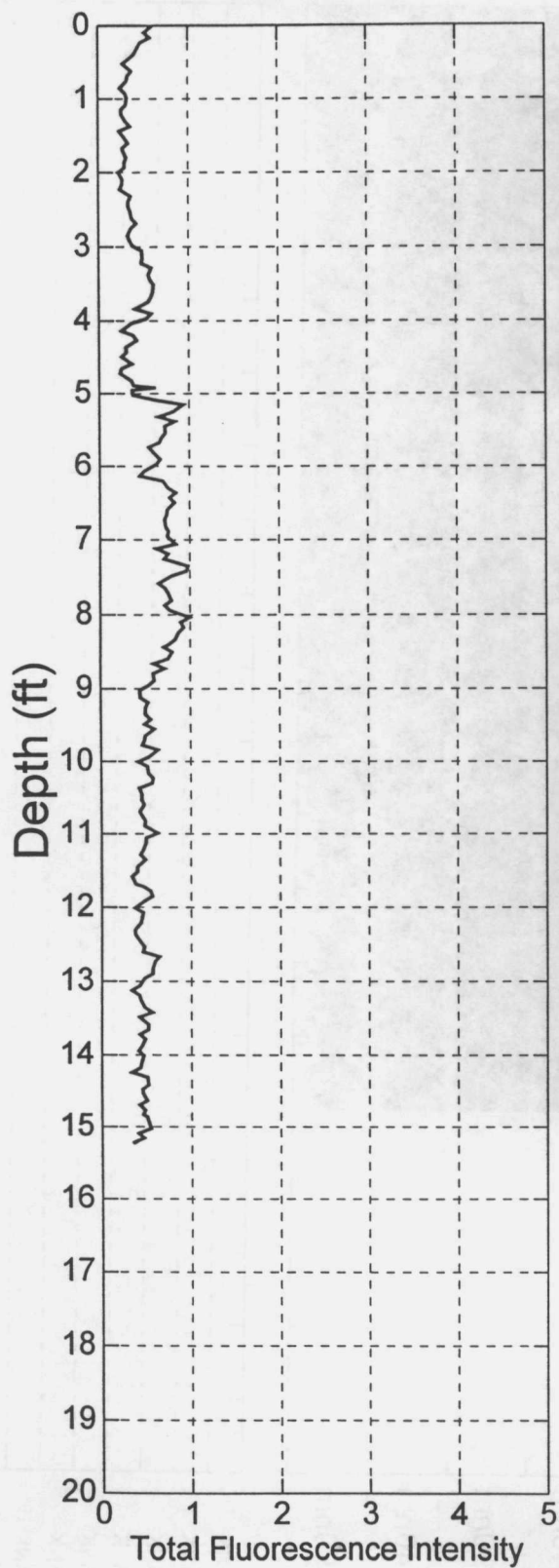
Acquisition Date: 04-29-1998



CPT45

Measured LIF End Depth
15.22 ft
Measured Peak Fluorescence
0.9901%

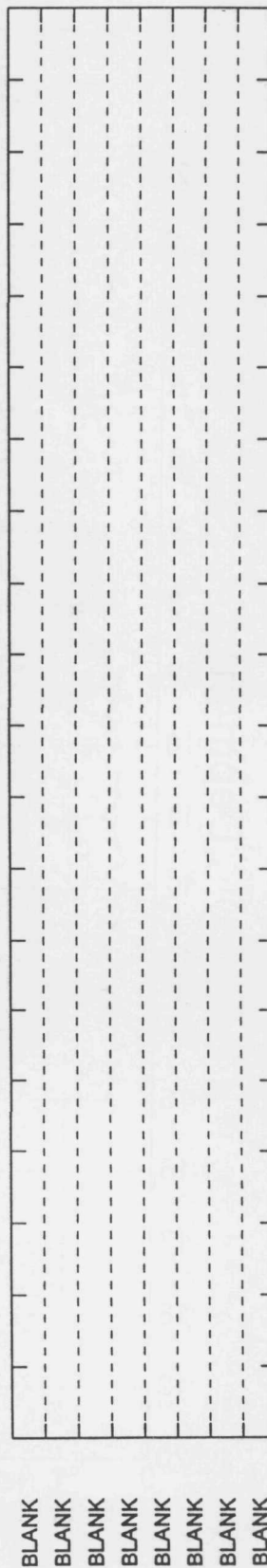
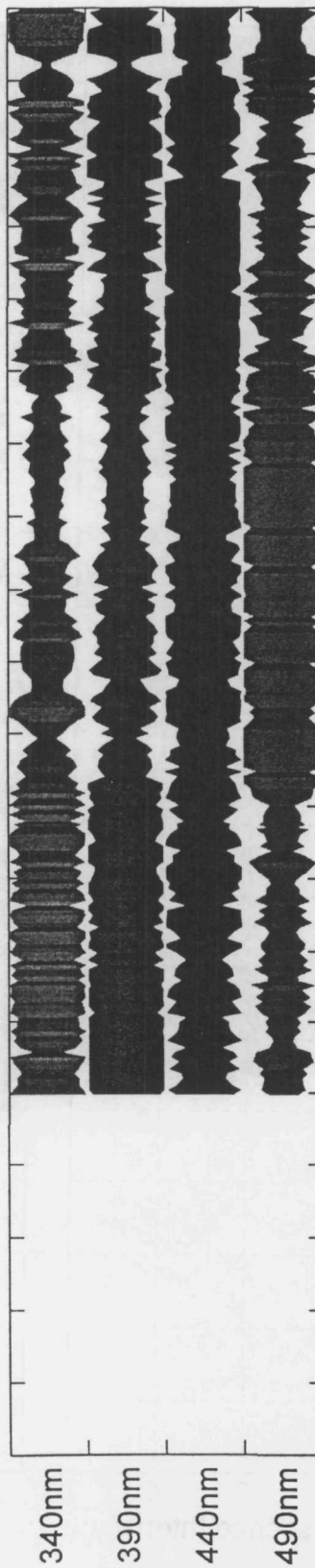
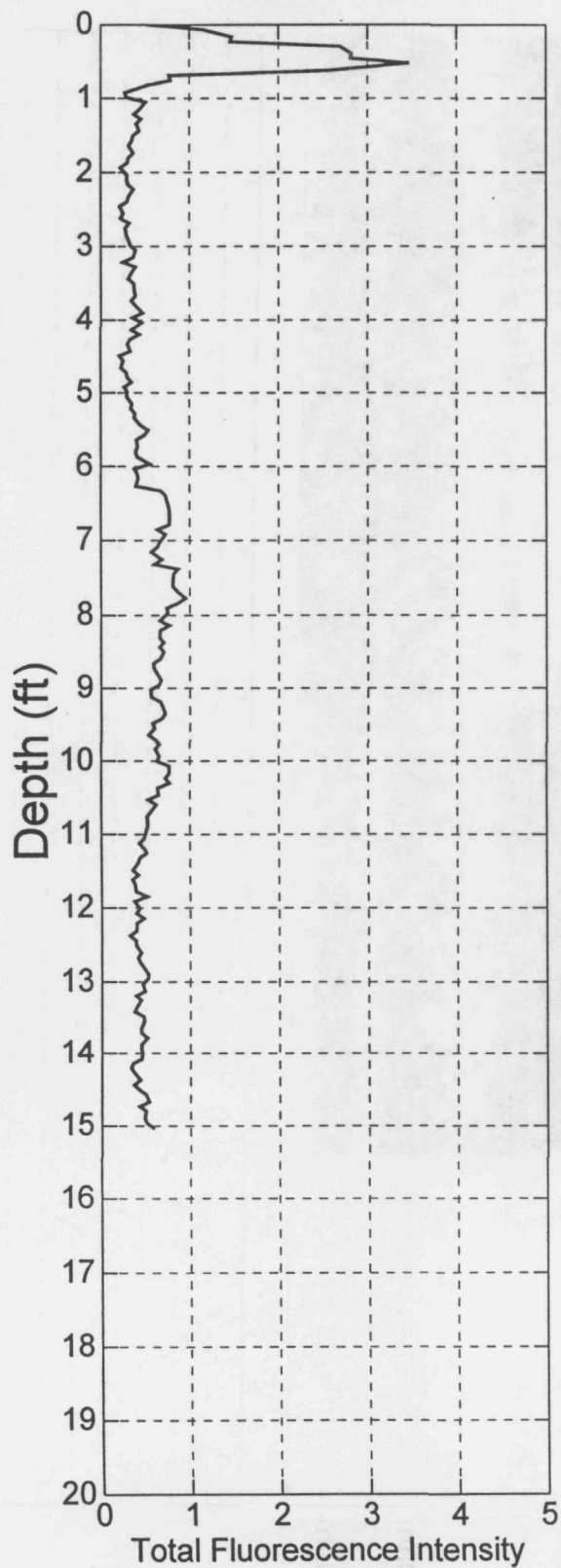
Job#: 0301-8077
Acquisition Date: 04-29-1998



CPT46

Measured LIF End Depth
15.03 ft
Measured Peak Fluorescence
3.469%

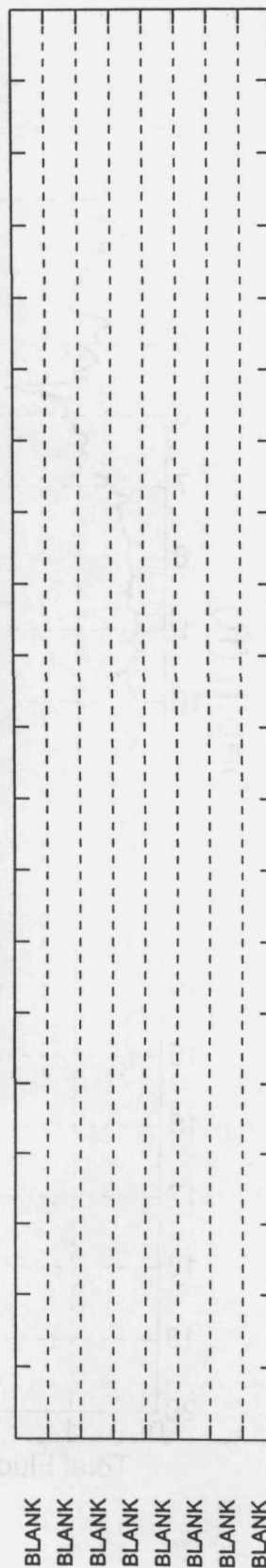
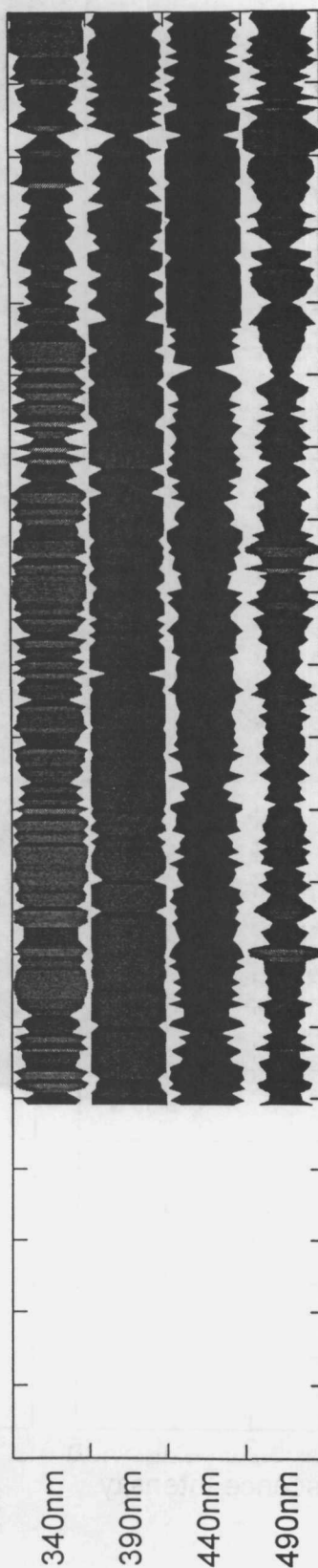
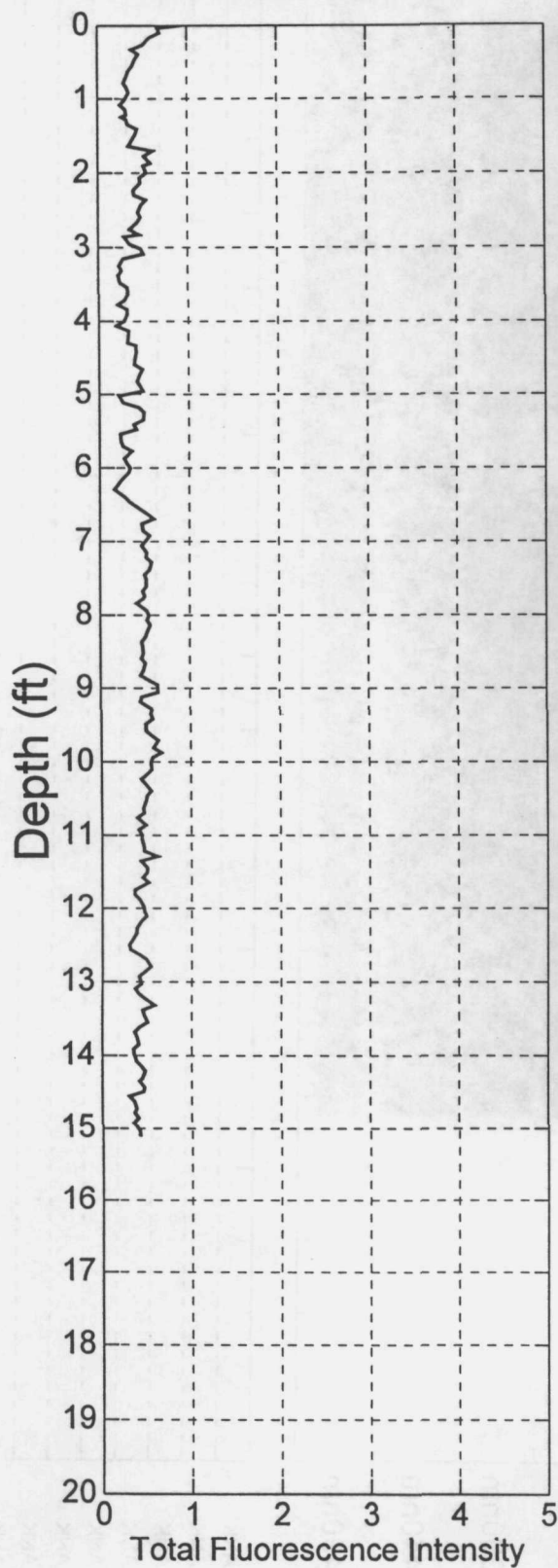
Job#: 0301-8077
Acquisition Date: 04-29-1998



CPT47

Measured LIF End Depth
15.09 ft
Measured Peak Fluorescence
0.6934%

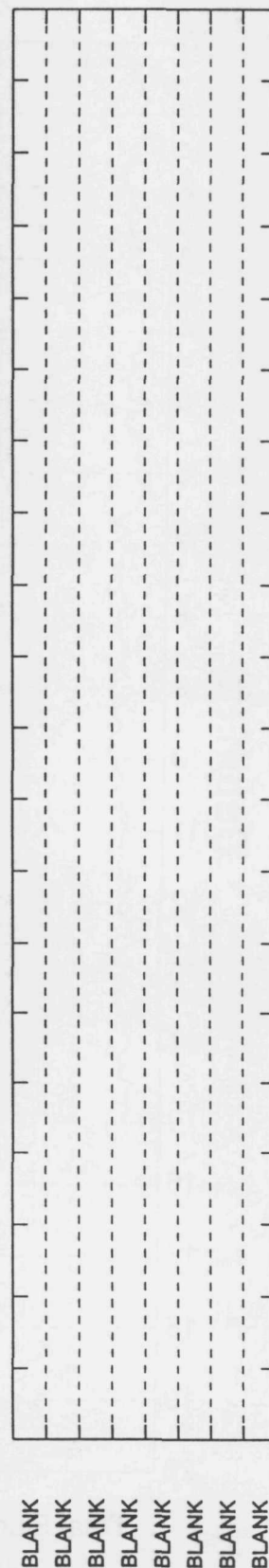
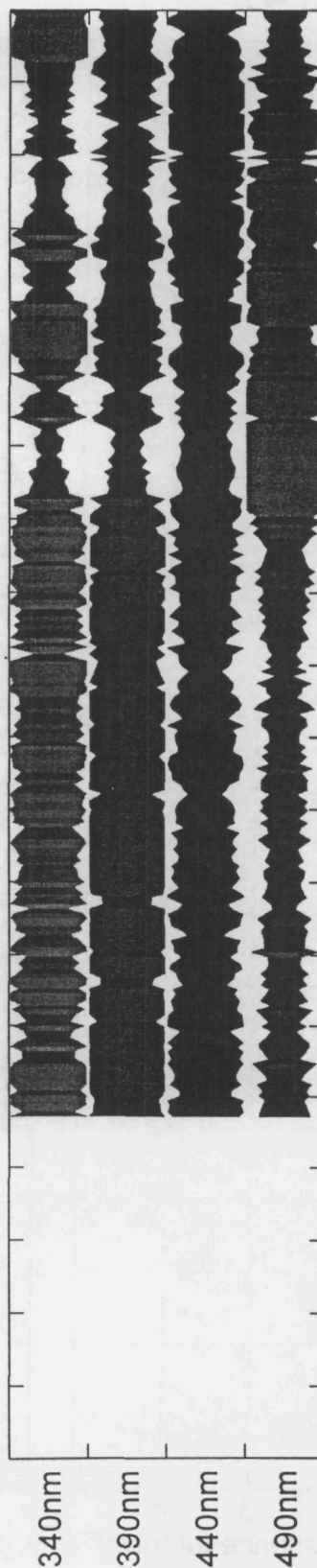
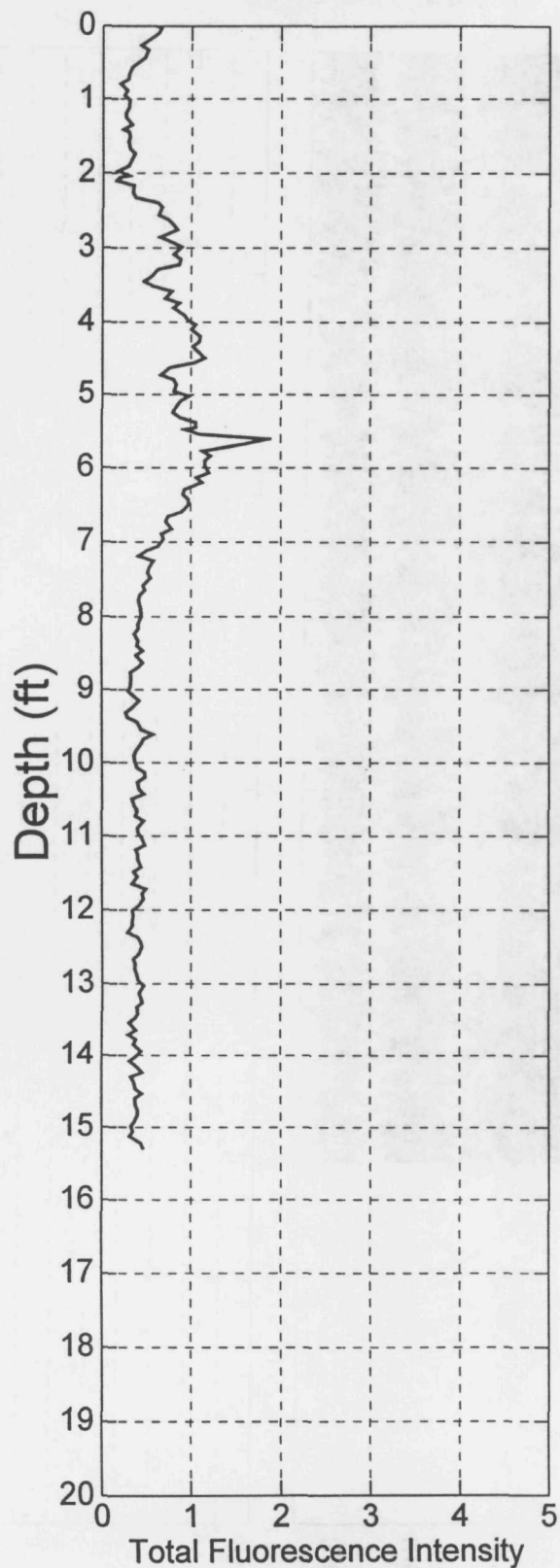
Job#: 0301-8077
Acquisition Date: 04-29-1998



CPT48

Measured LIF End Depth
15.29 ft
Measured Peak Fluorescence
1.857%

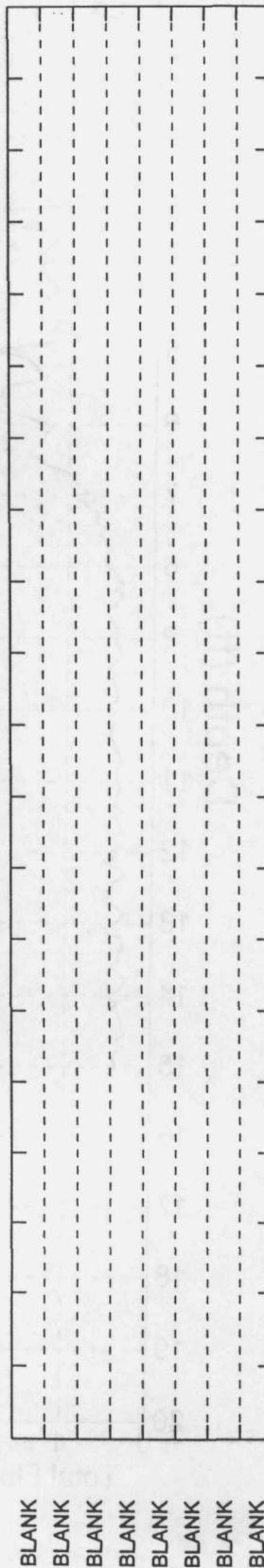
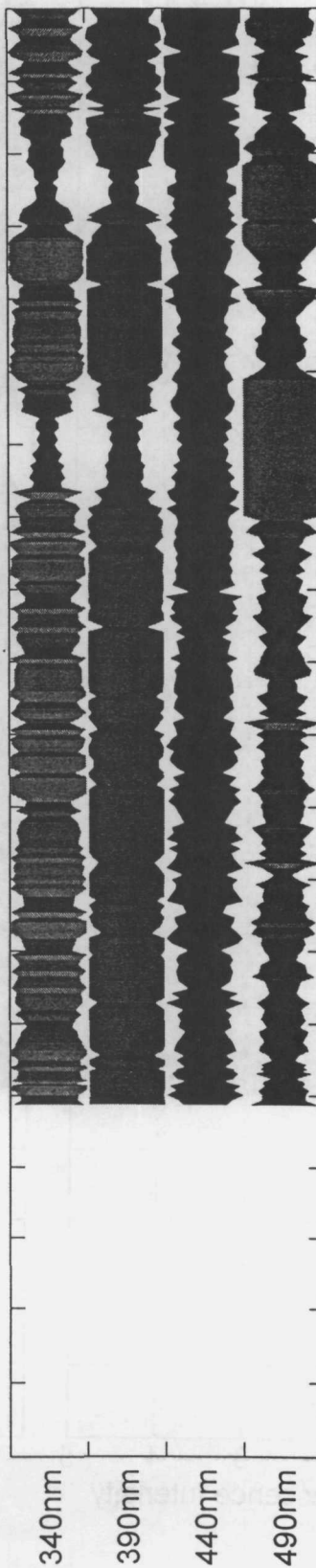
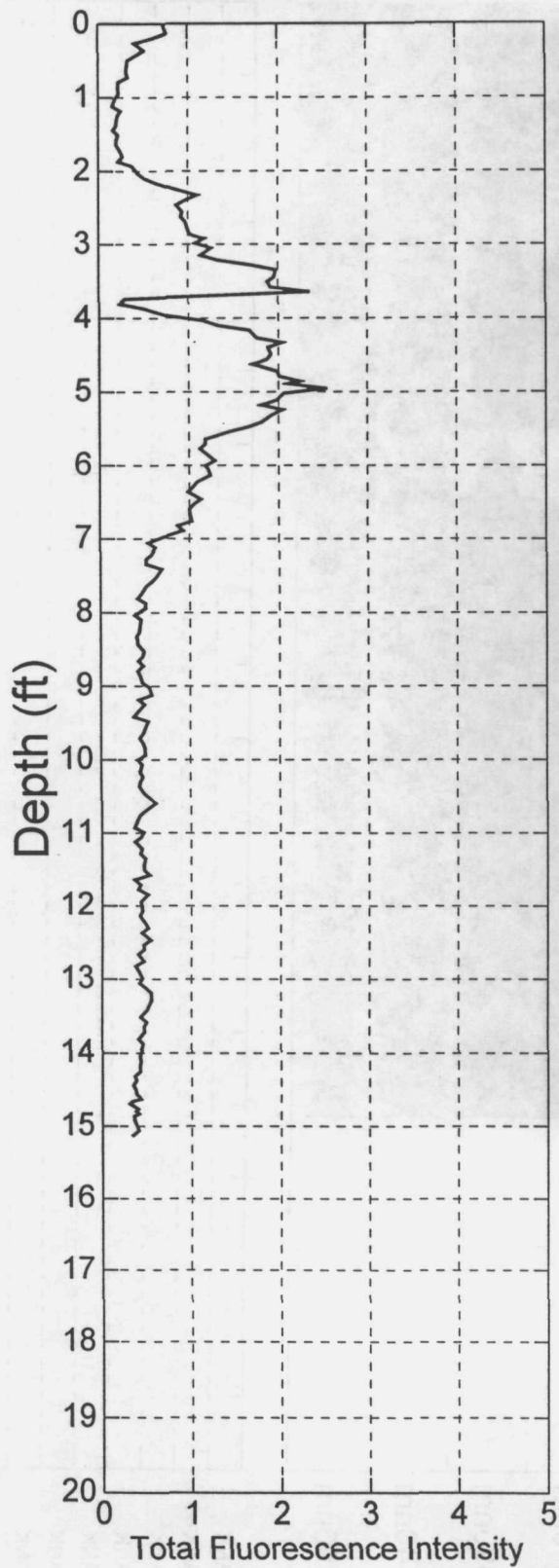
Job#: 0301-8077
Acquisition Date: 04-29-1998



CPT49

Measured LIF End Depth
15.12 ft
Measured Peak Fluorescence
2.518%

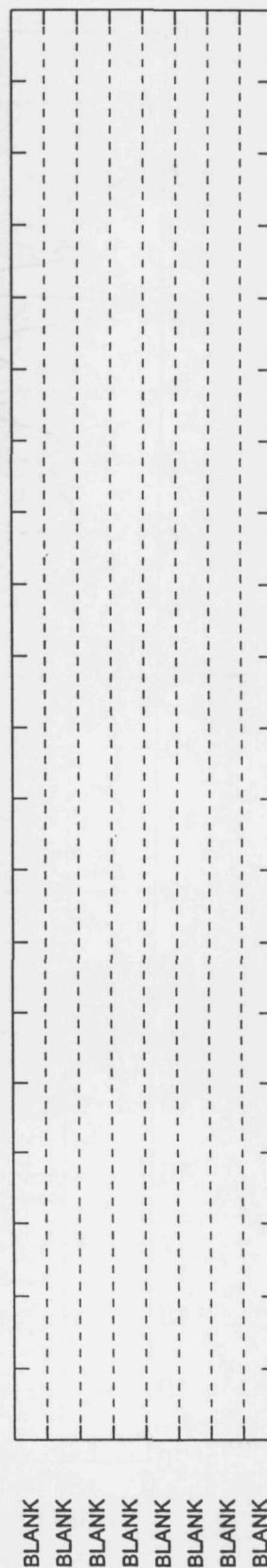
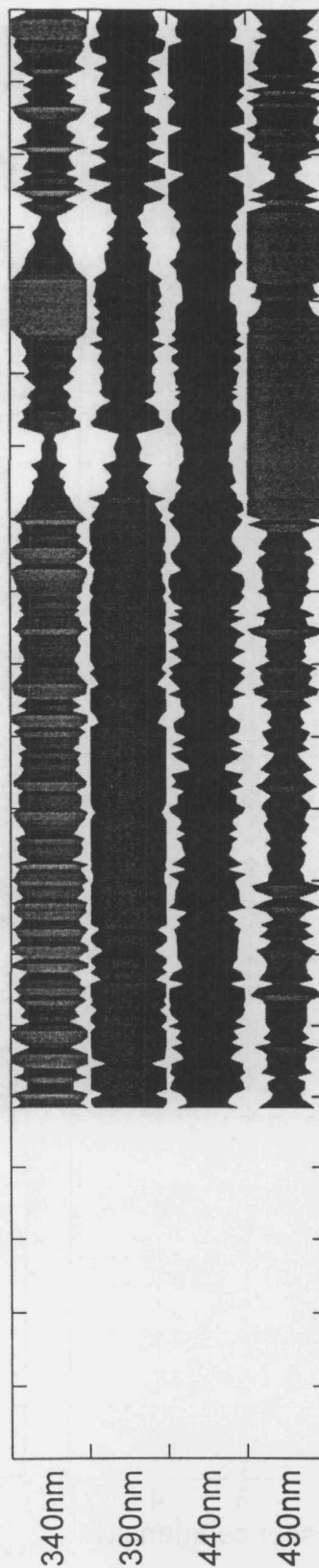
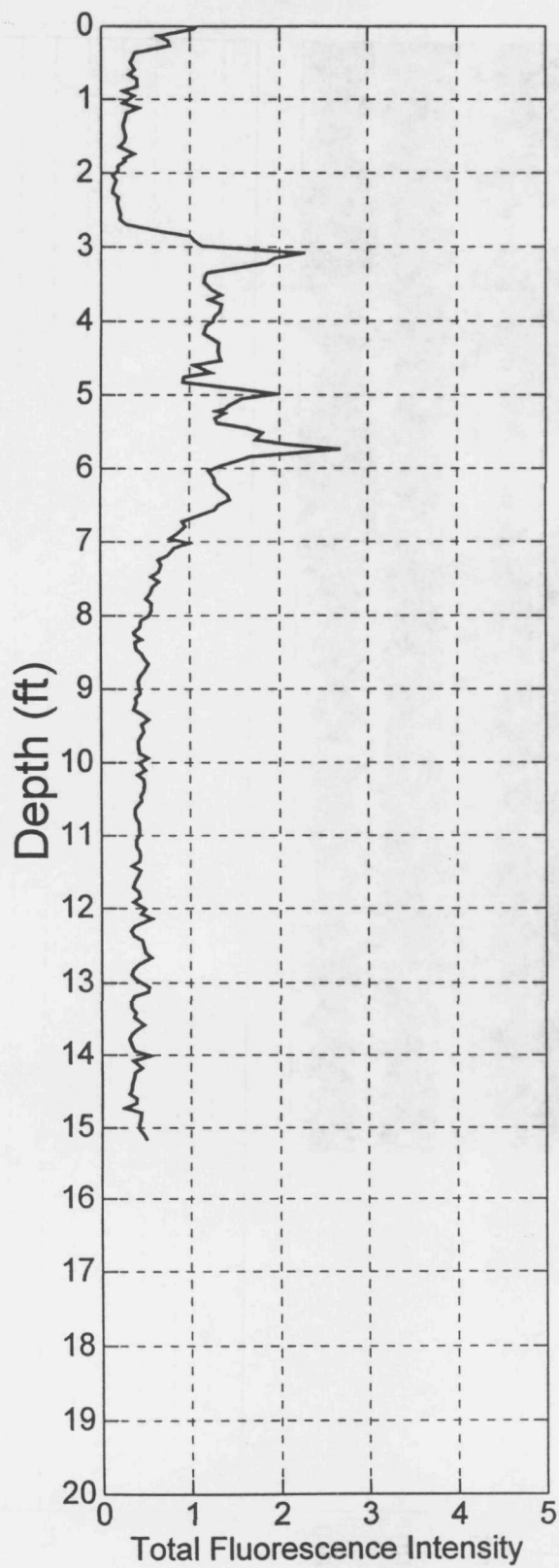
Job#: 0301-8077
Acquisition Date: 04-29-1998



CPT50

Measured LIF End Depth
15.16 ft
Measured Peak Fluorescence
2.684%

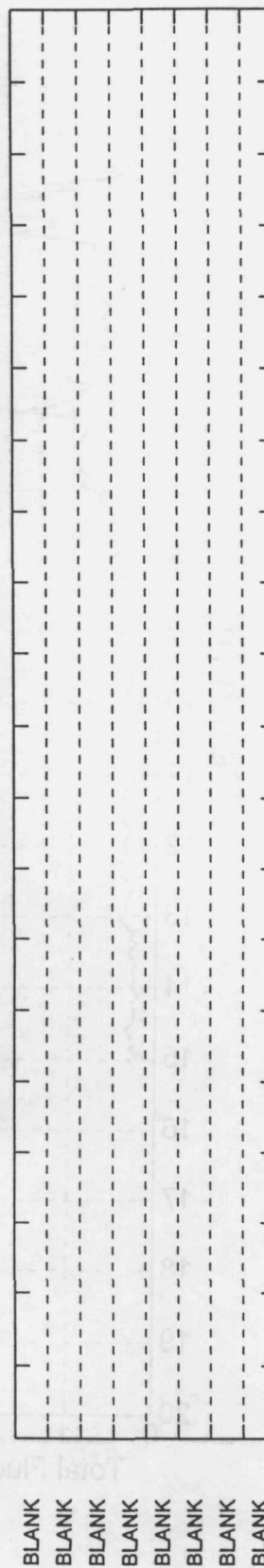
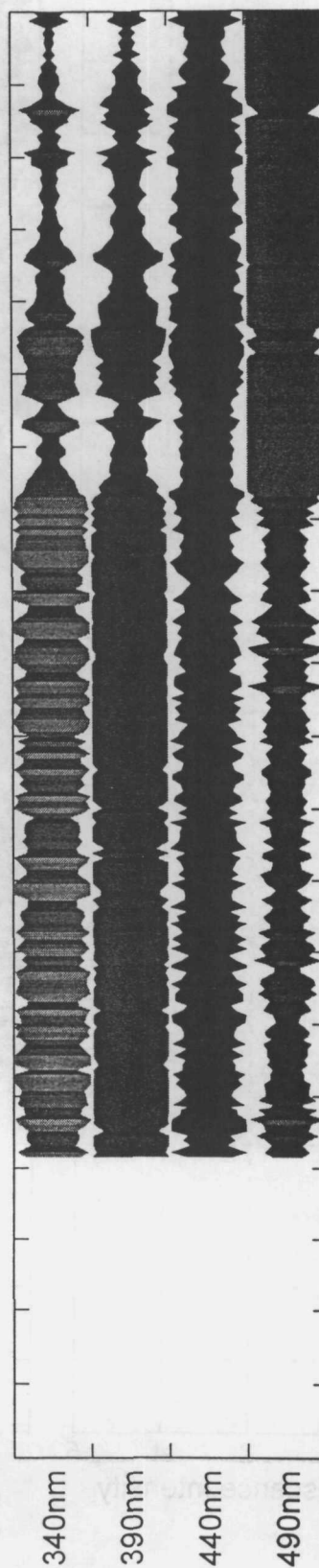
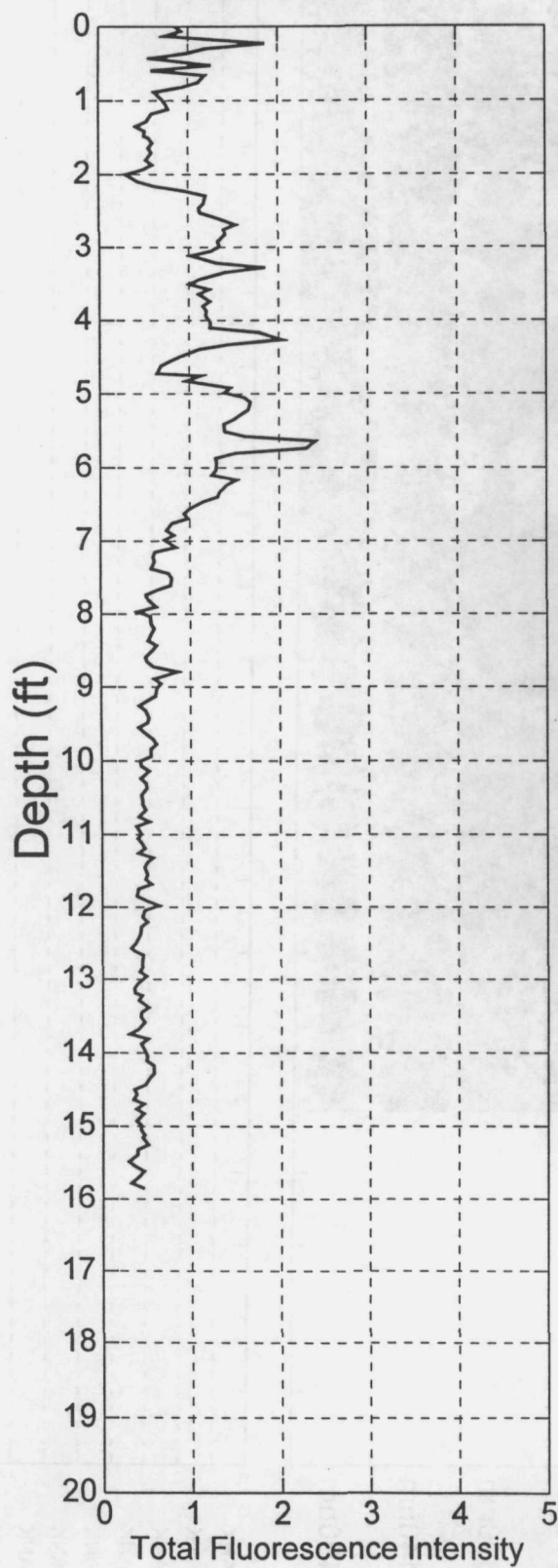
Job#: 0301-8077
Acquisition Date: 04-29-1998



CPT51

Measured LIF End Depth
15.85 ft
Measured Peak Fluorescence
2.408%

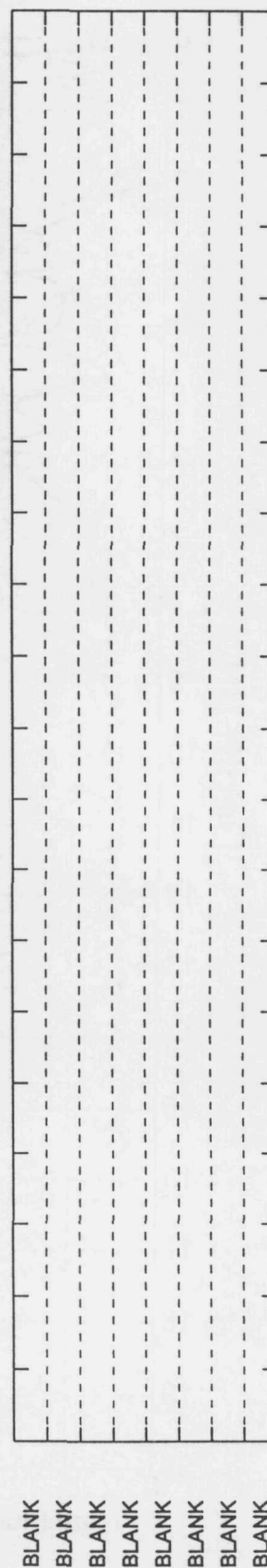
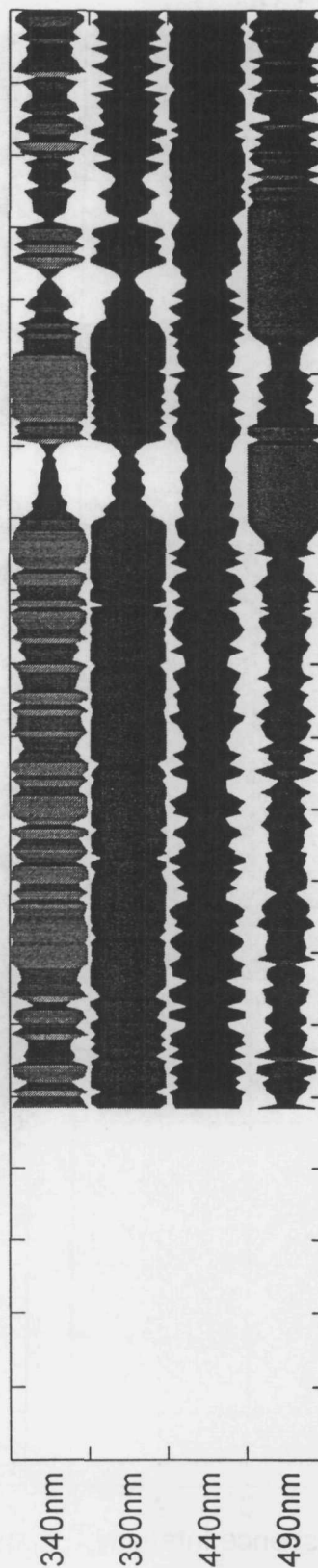
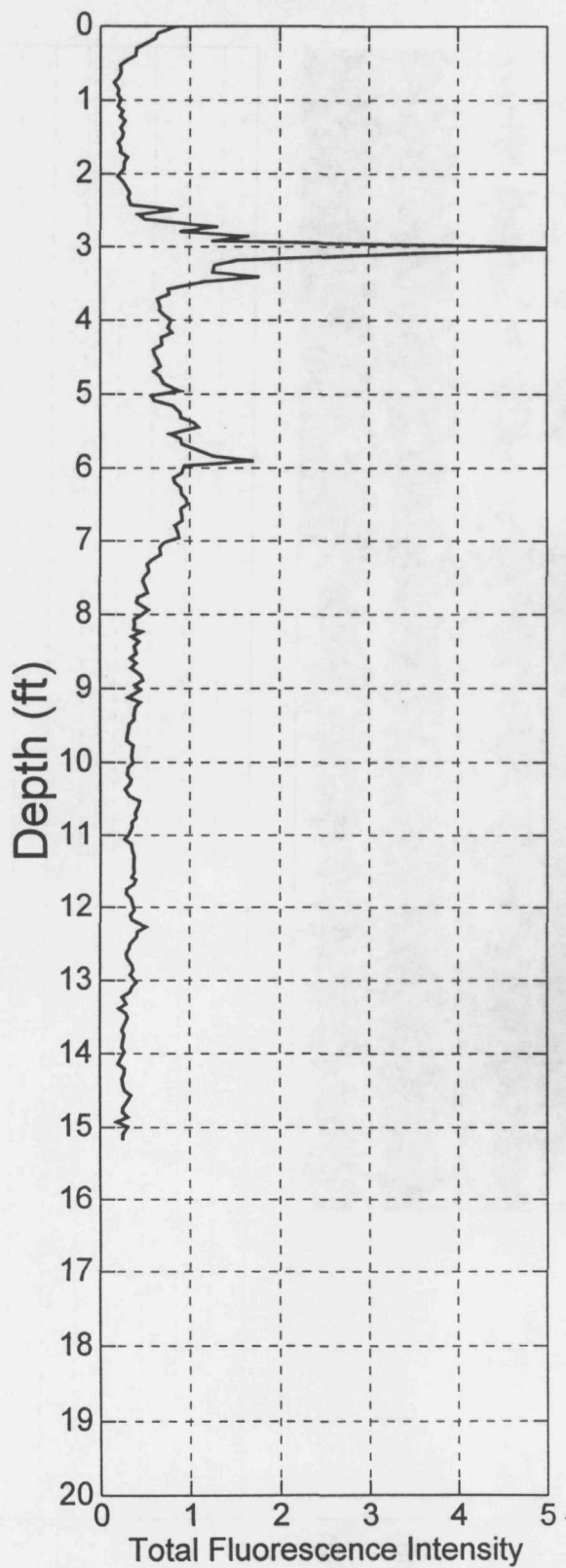
Job#: 0301-8077
Acquisition Date: 04-29-1998



CPT52

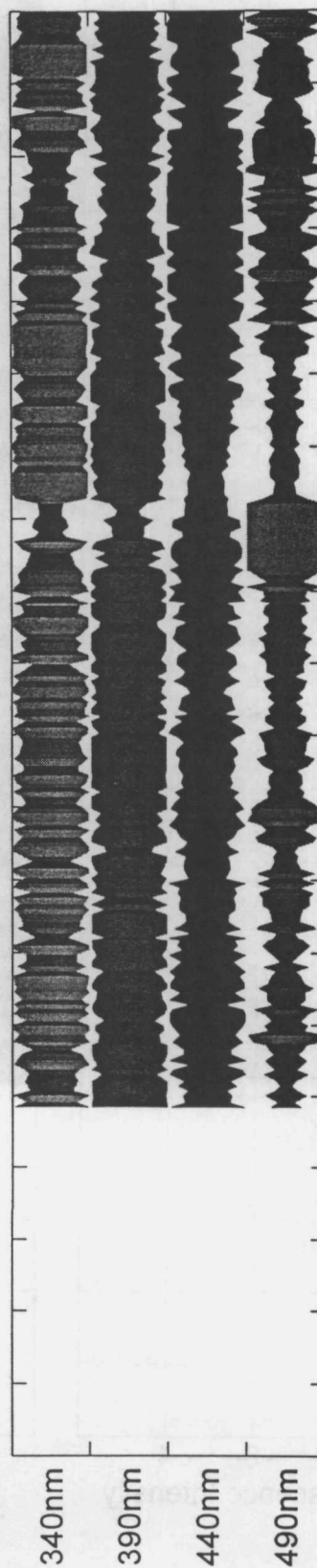
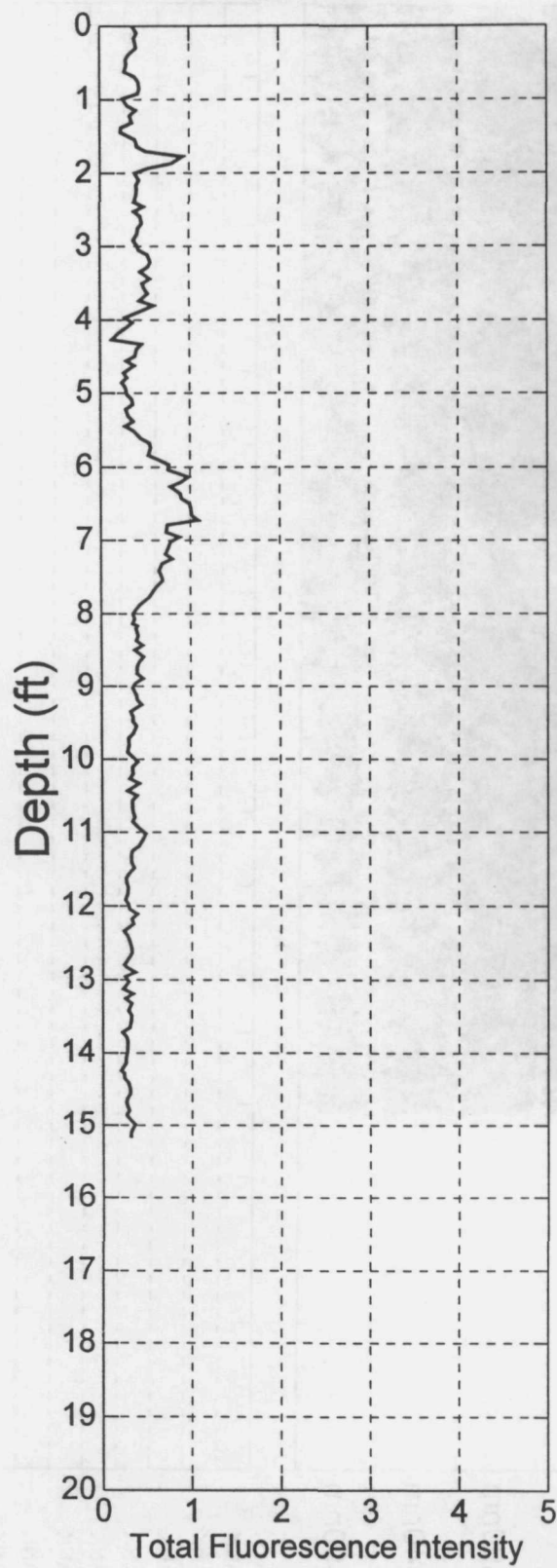
Measured LIF End Depth
15.16 ft
Measured Peak Fluorescence
5.411%

Job#: 0301-8077
Acquisition Date: 04-29-1998



Measured LIF End Depth
15.16 ft
Measured Peak Fluorescence
1.082%

Job#: 0301-8077
Acquisition Date: 04-29-1998



BLANK
BLANK
BLANK
BLANK
BLANK
BLANK
BLANK
BLANK

CPT54

Measured LIF End Depth

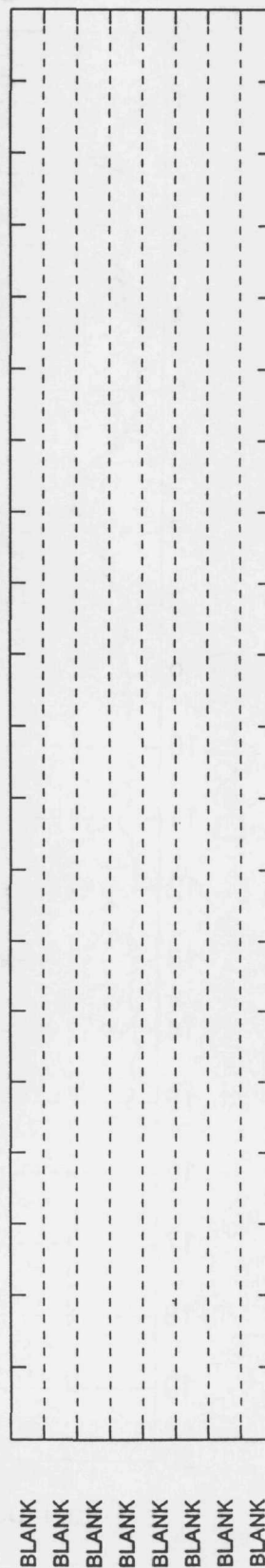
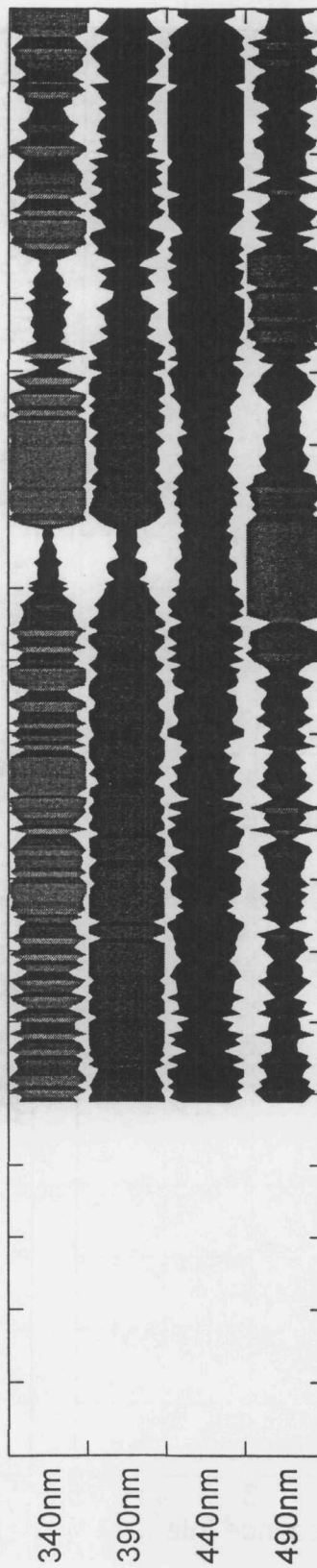
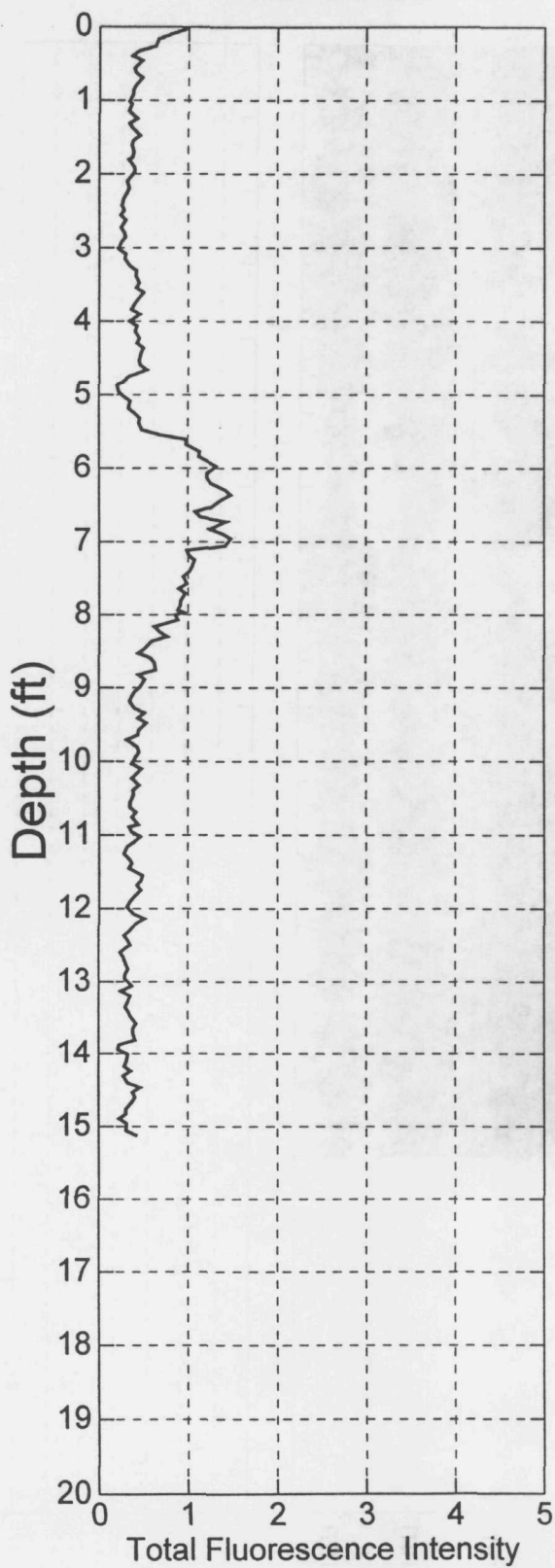
15.12 ft

Measured Peak Fluorescence

1.479%

Job#: 0301-8077

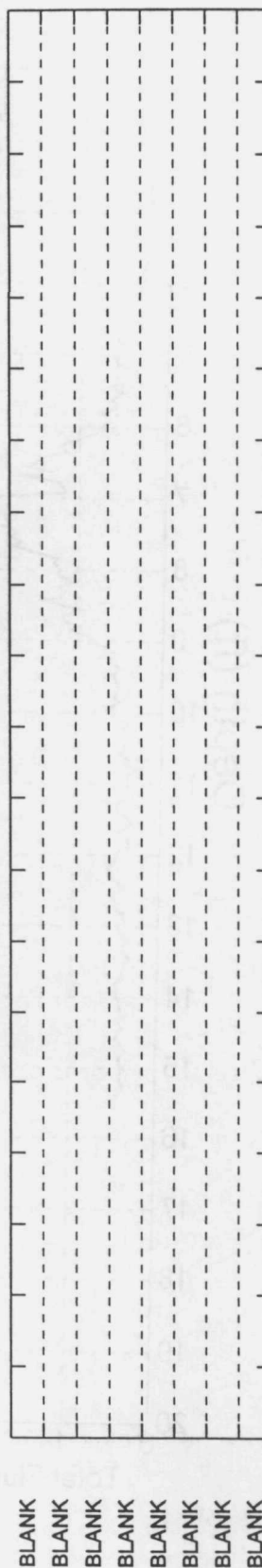
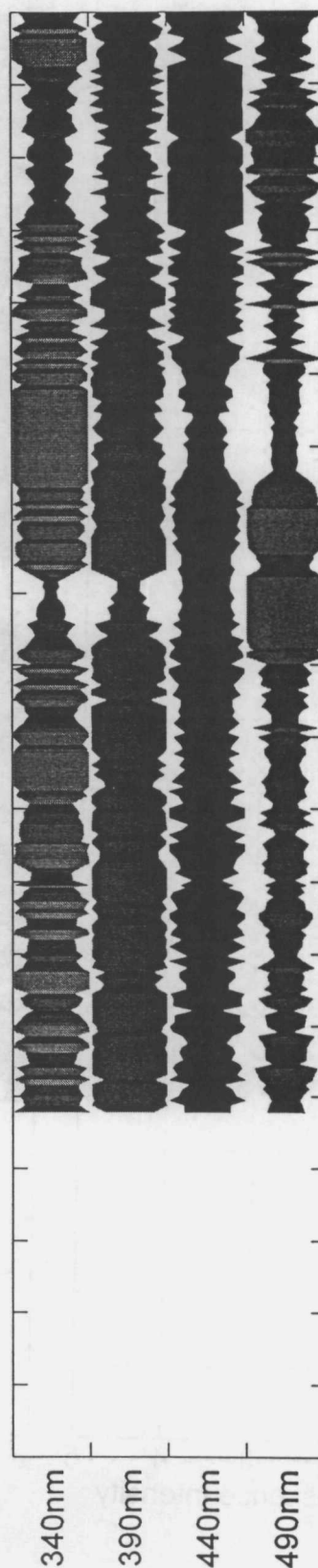
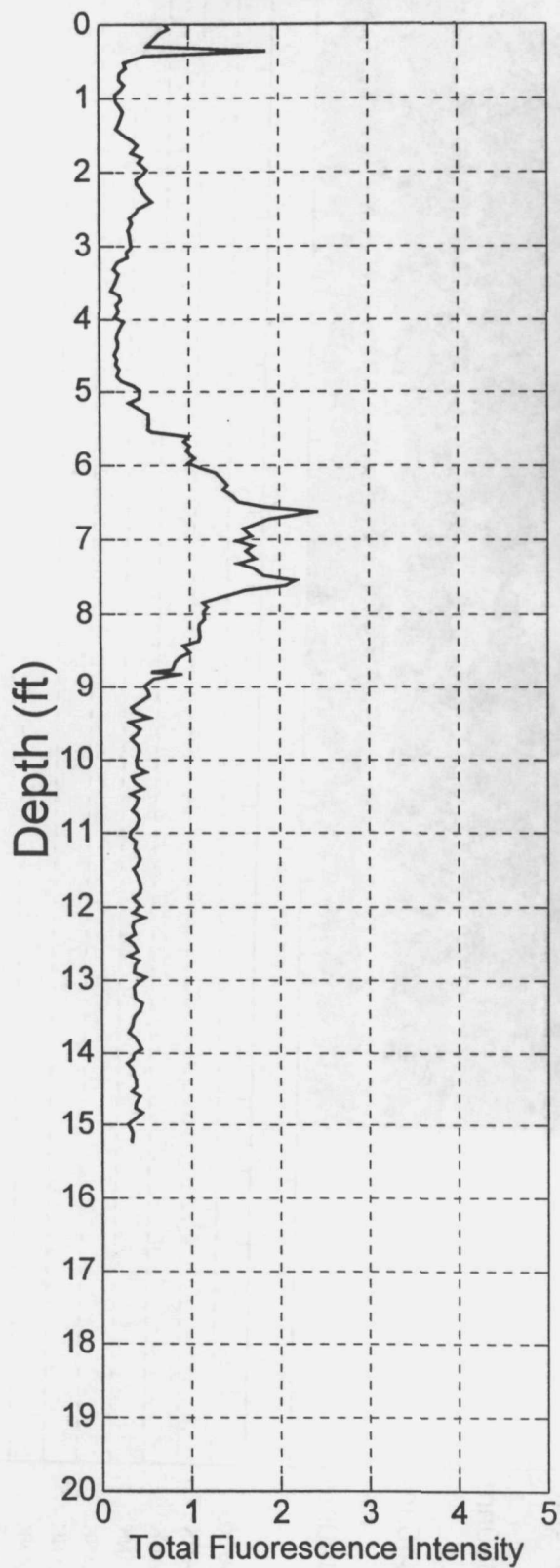
Acquisition Date: 04-29-1998



CPT55

Measured LIF End Depth
15.22 ft
Measured Peak Fluorescence
2.407%

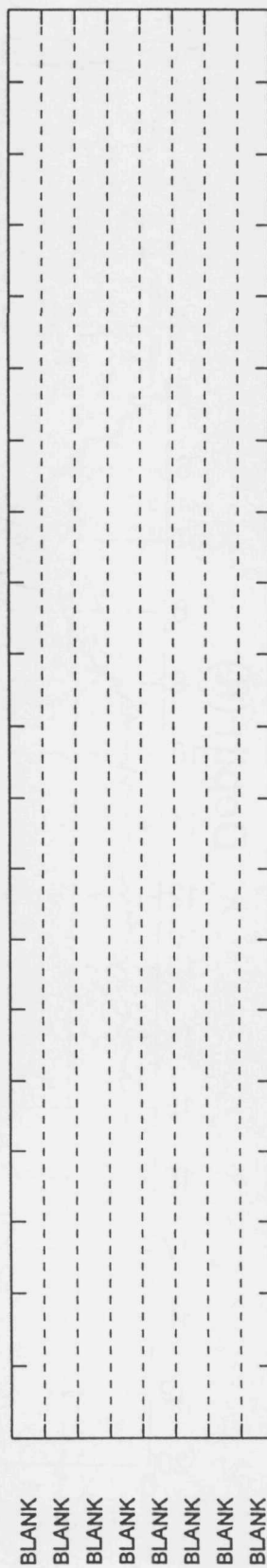
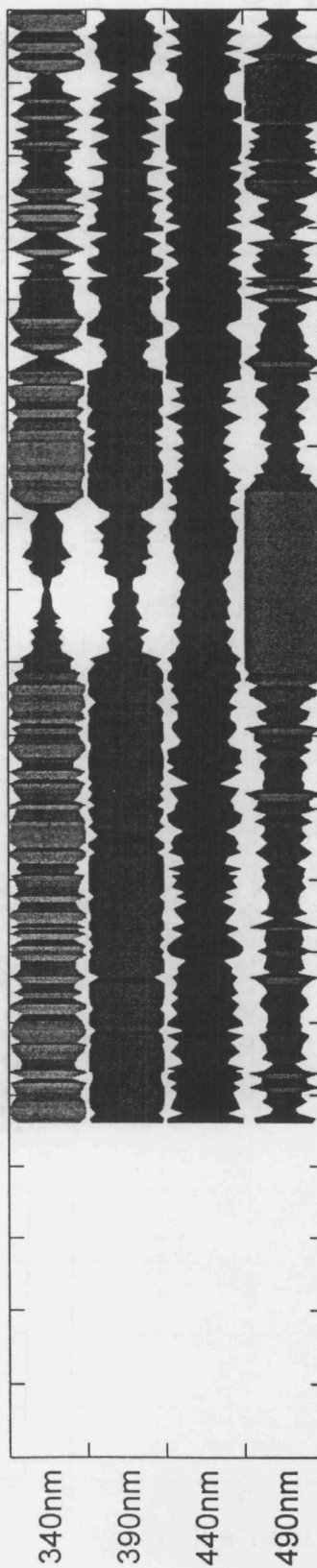
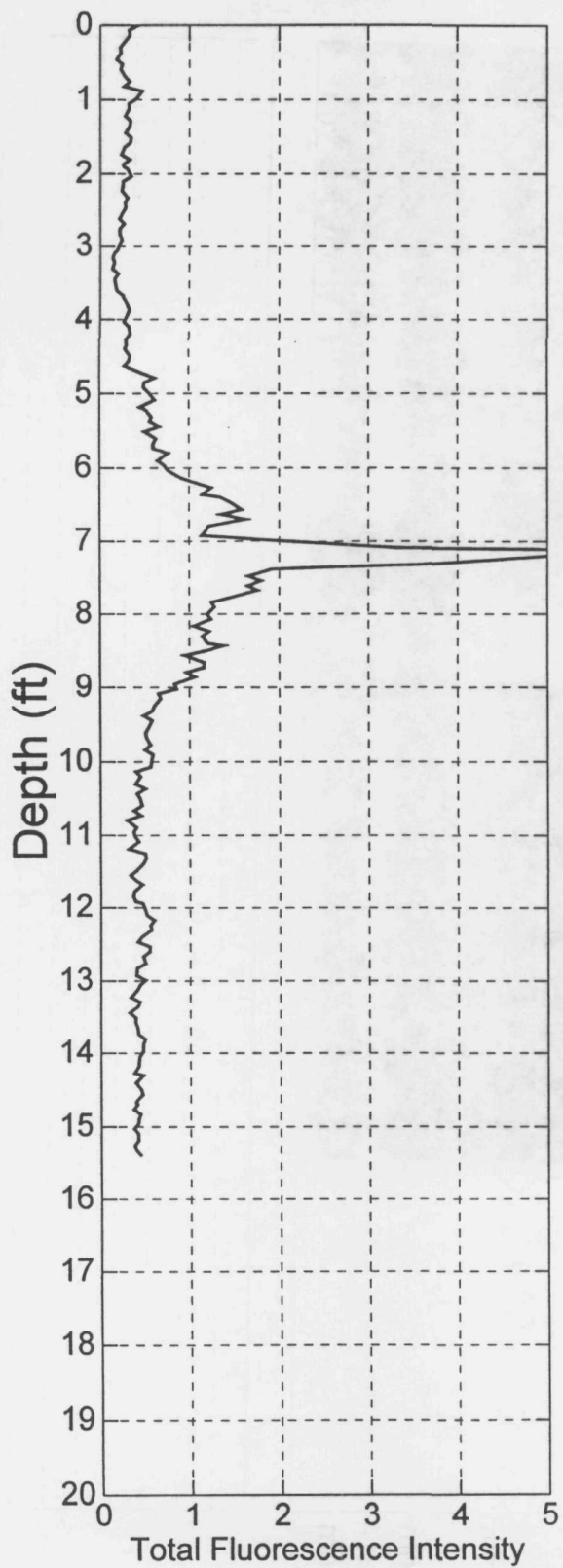
Job#: 0301-8077
Acquisition Date: 04-29-1998



CPT56

Measured LIF End Depth
15.39 ft
Measured Peak Fluorescence
5.951%

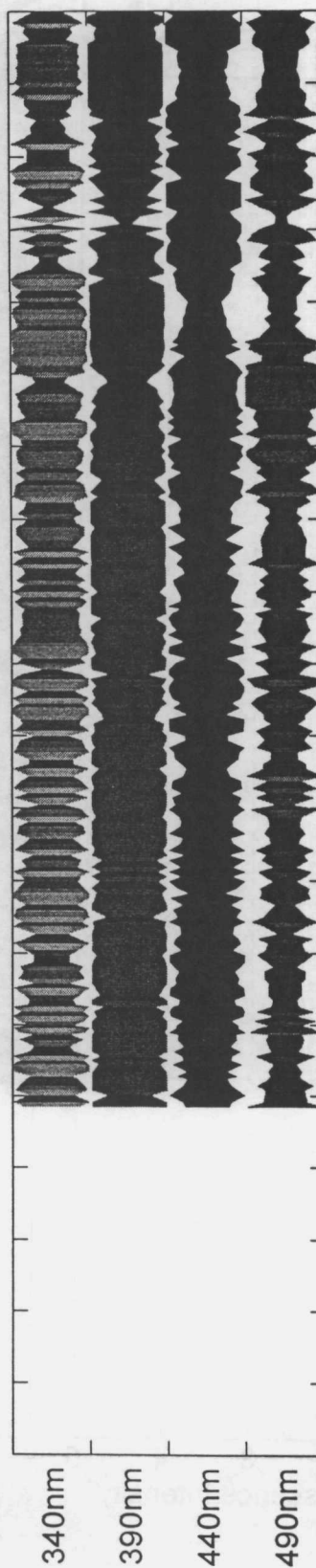
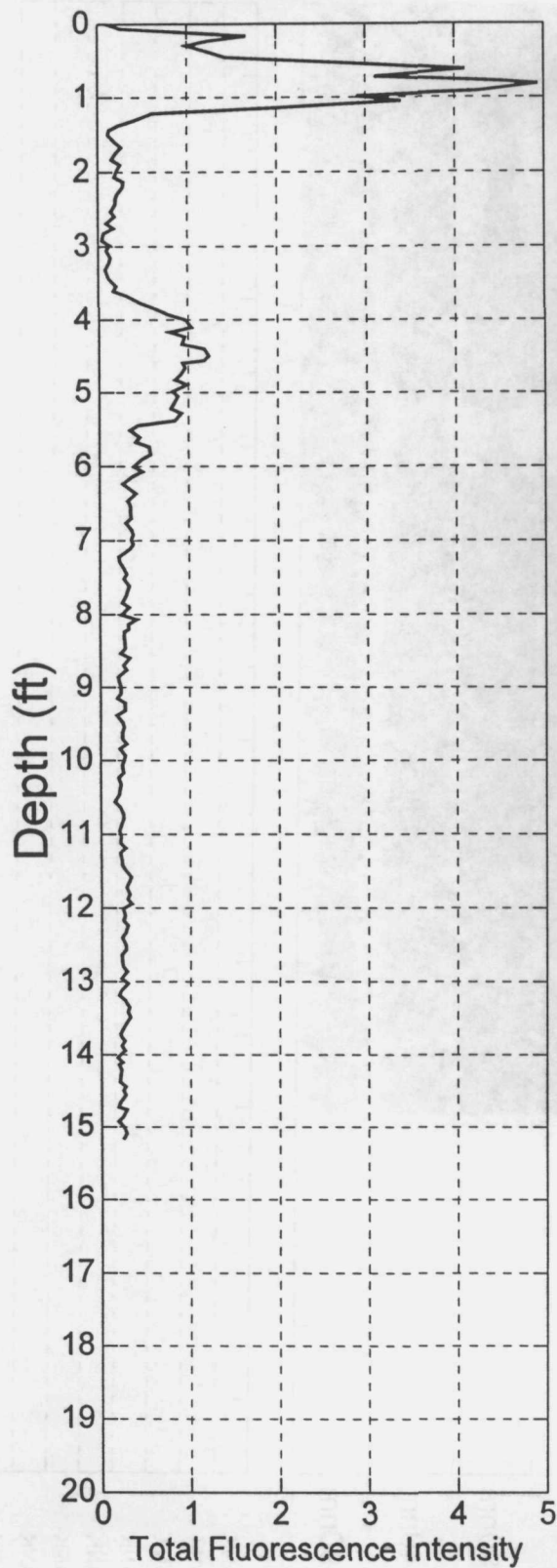
Job#: 0301-8077
Acquisition Date: 04-29-1998



CPT57

Measured LIF End Depth
15.16 ft
Measured Peak Fluorescence
4.929%

Job#: 0301-8077
Acquisition Date: 04-30-1998

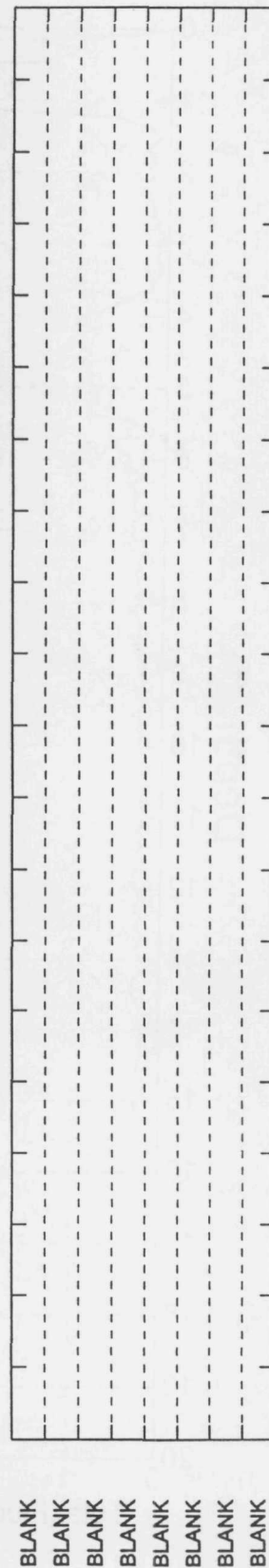
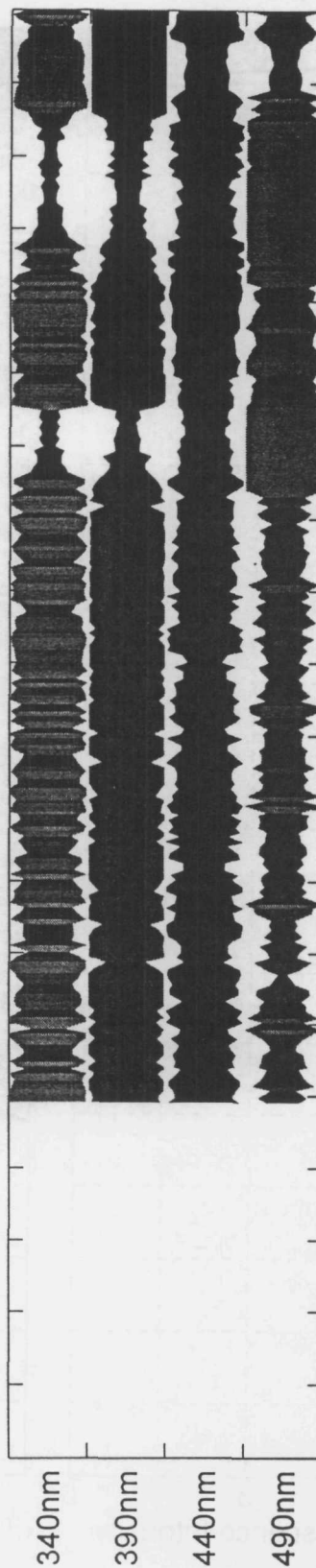
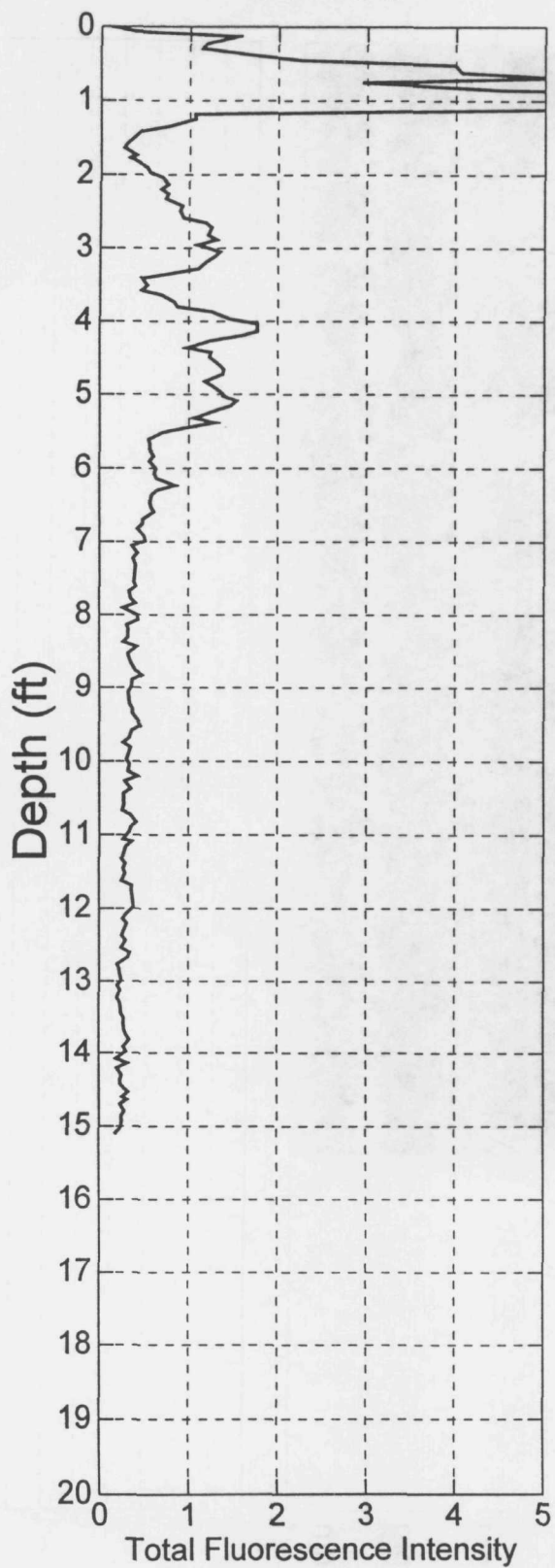


BLANK
BLANK
BLANK
BLANK
BLANK
BLANK
BLANK

CPT58

Measured LIF End Depth
15.09 ft
Measured Peak Fluorescence
8.187%

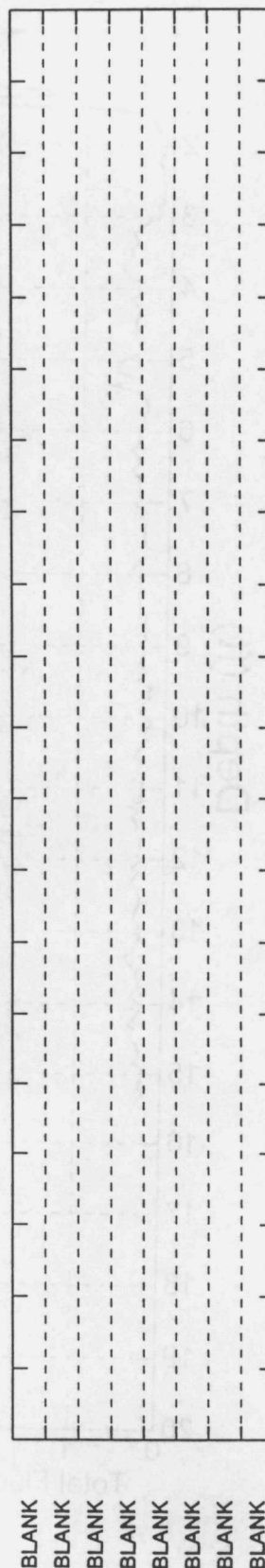
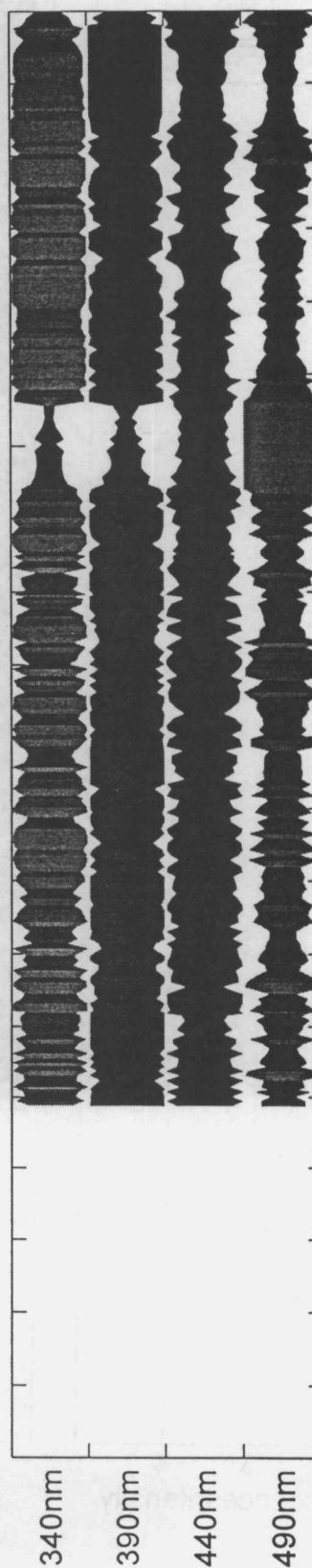
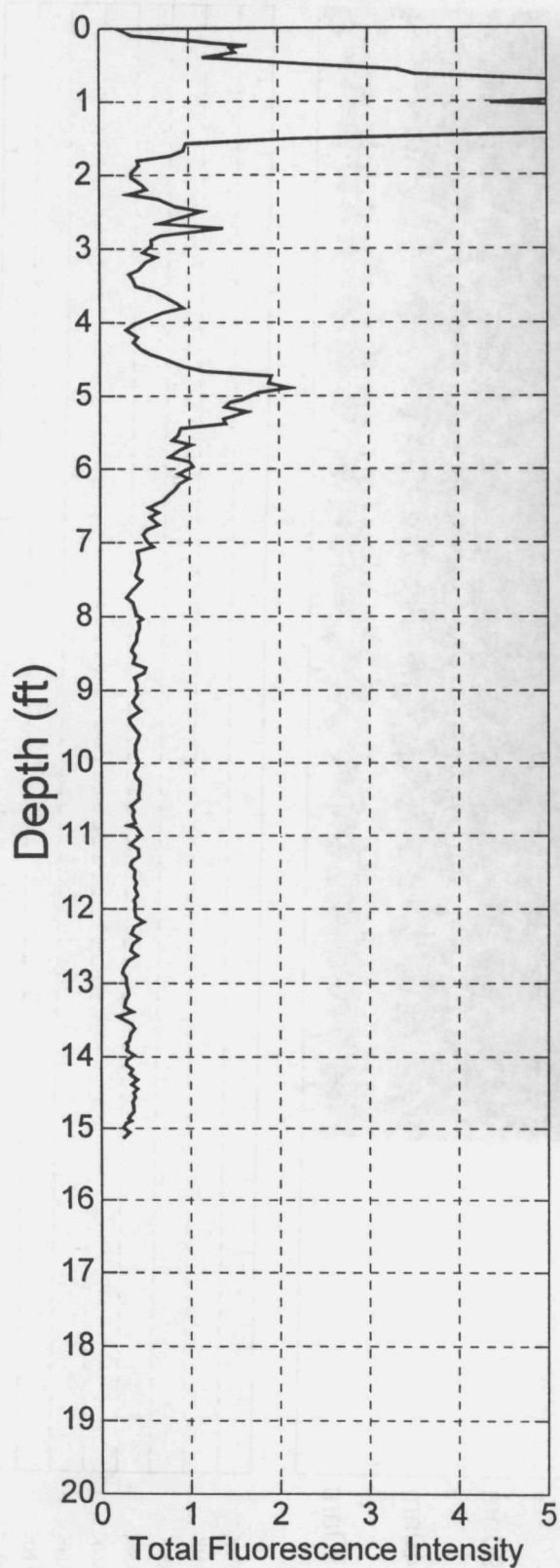
Job#: 0301-8077
Acquisition Date: 04-30-1998



CPT59

Measured LIF End Depth
15.12 ft
Measured Peak Fluorescence
7.199%

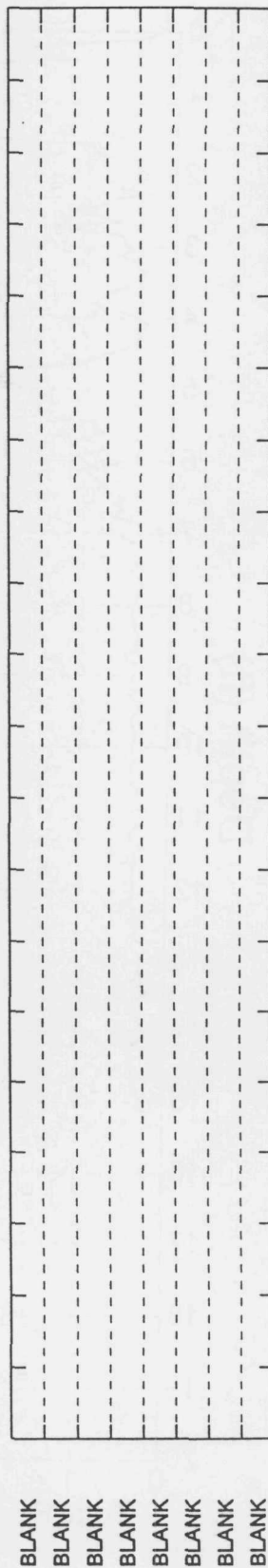
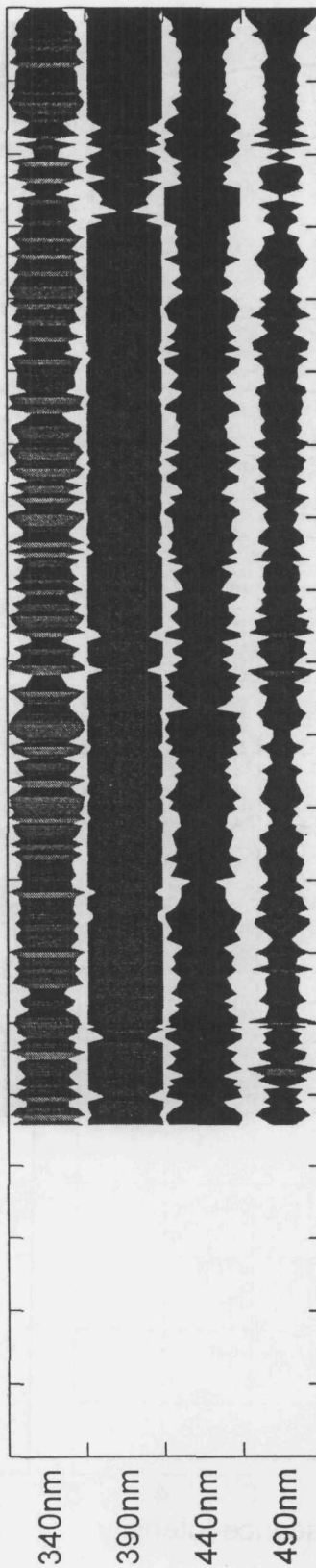
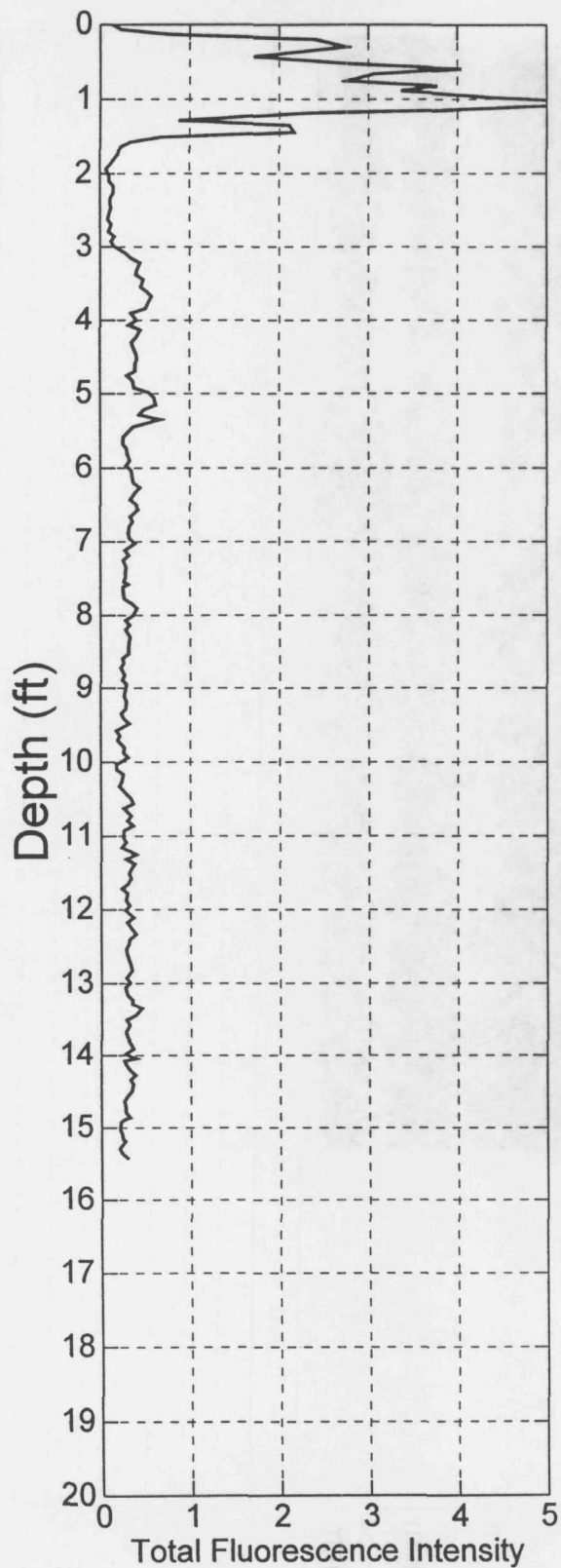
Job#: 0301-8077
Acquisition Date: 04-30-1998



CPT60

Measured LIF End Depth
15.42 ft
Measured Peak Fluorescence
5.852%

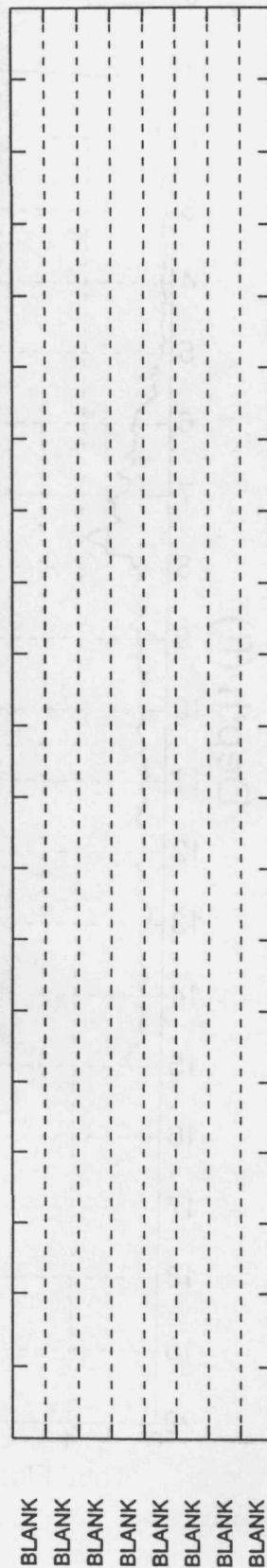
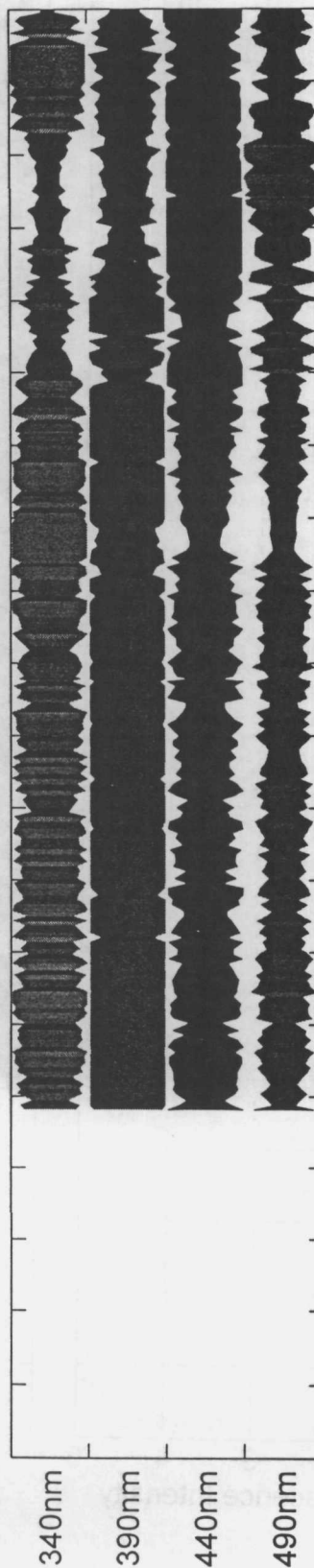
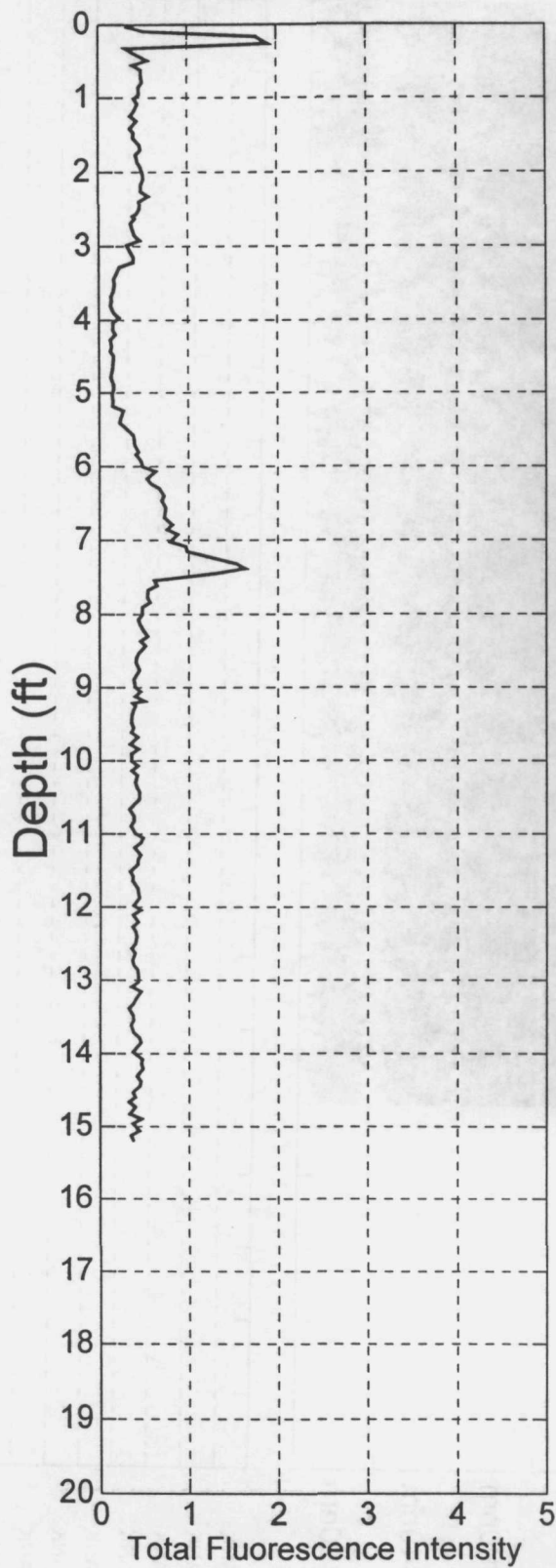
Job#: 0301-8077
Acquisition Date: 04-30-1998



CPT61

Measured LIF End Depth
15.19 ft
Measured Peak Fluorescence
1.906%

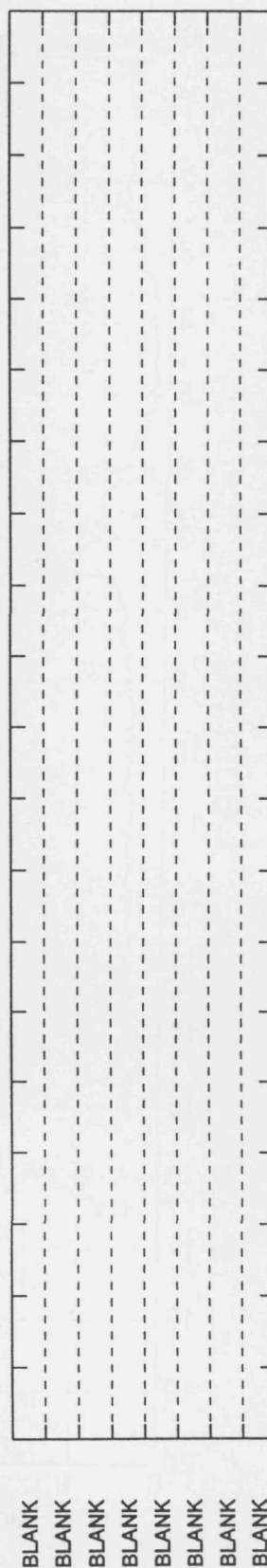
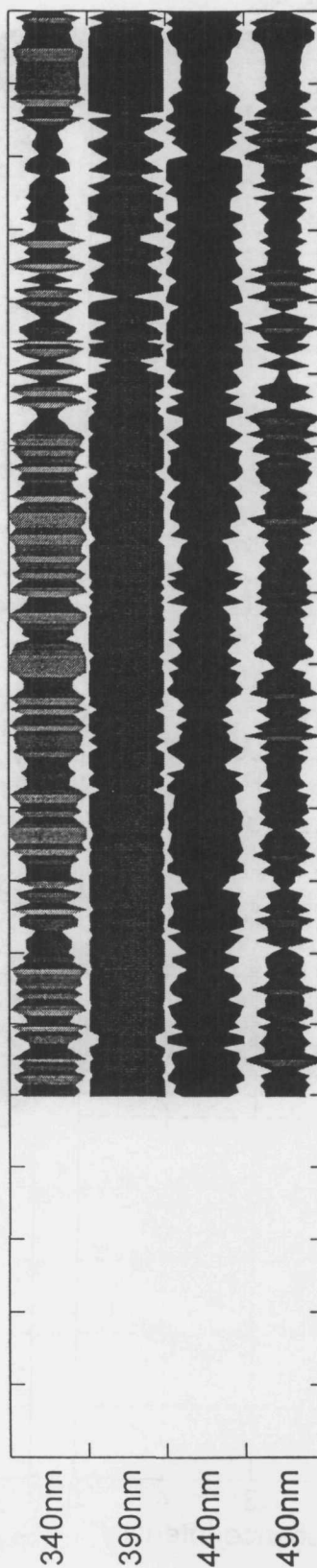
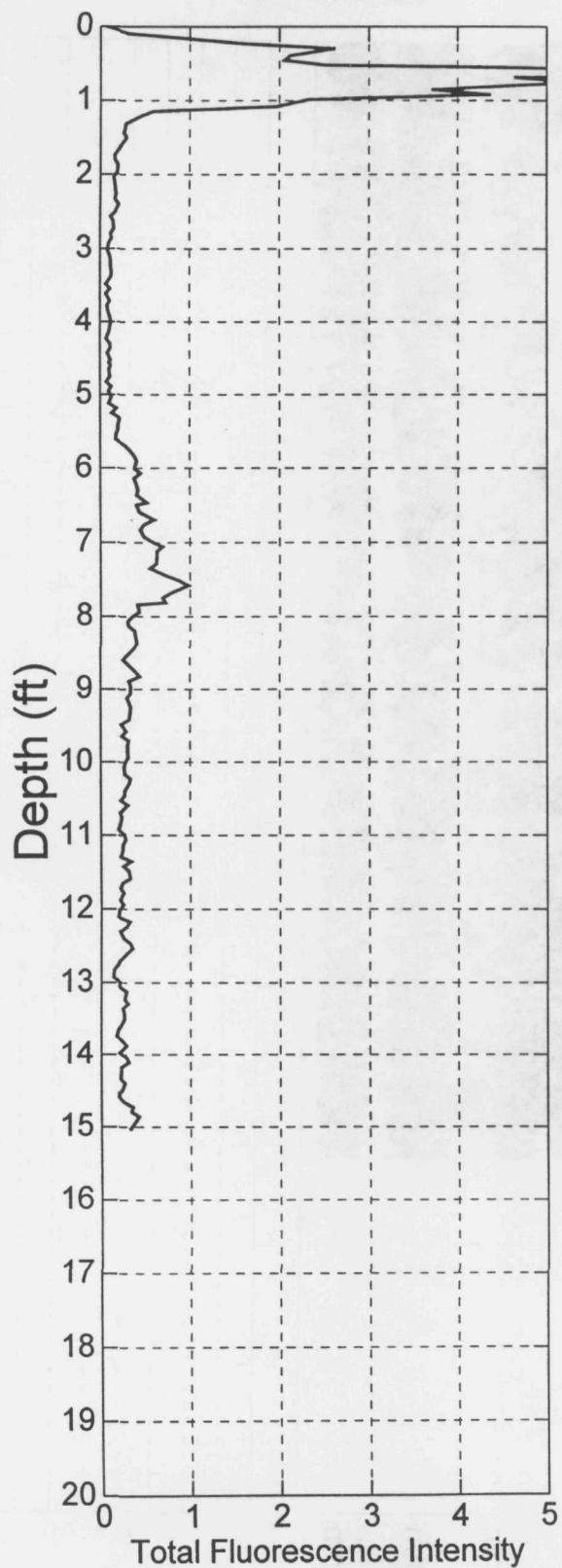
Job#: 0301-8077
Acquisition Date: 04-30-1998



CPT62

Measured LIF End Depth
15.03 ft
Measured Peak Fluorescence
9.029%

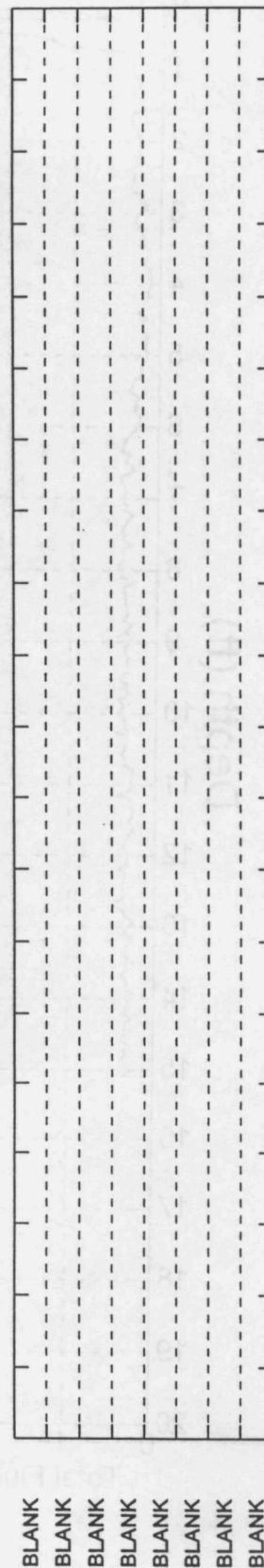
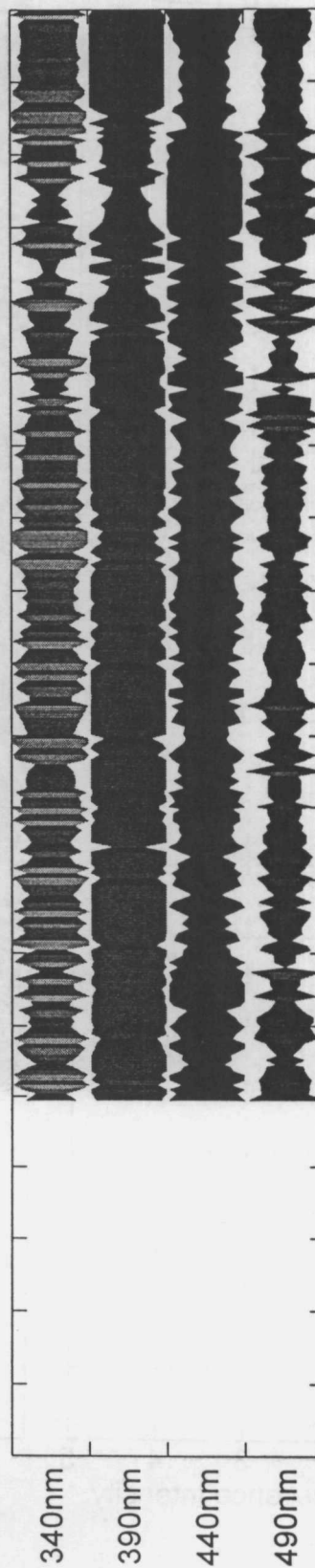
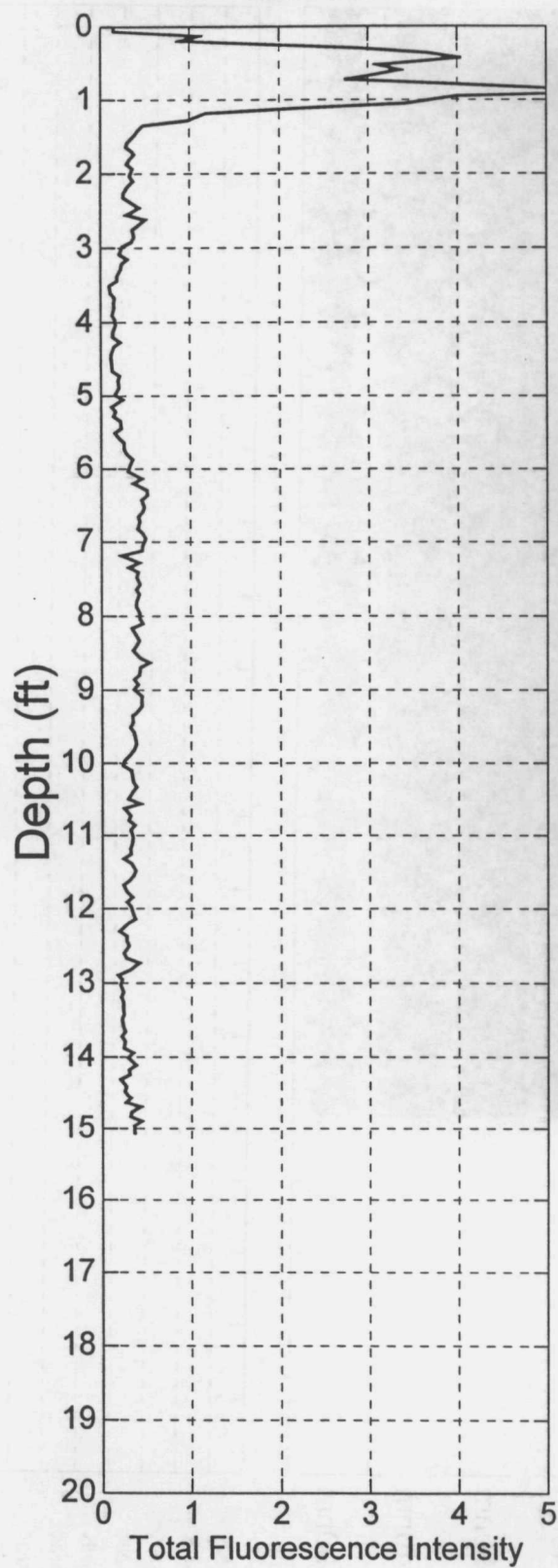
Job#: 0301-8077
Acquisition Date: 04-30-1998



CPT63

Measured LIF End Depth
15.06 ft
Measured Peak Fluorescence
5.922%

Job#: 0301-8077
Acquisition Date: 04-30-1998



CPT64

Measured LIF End Depth

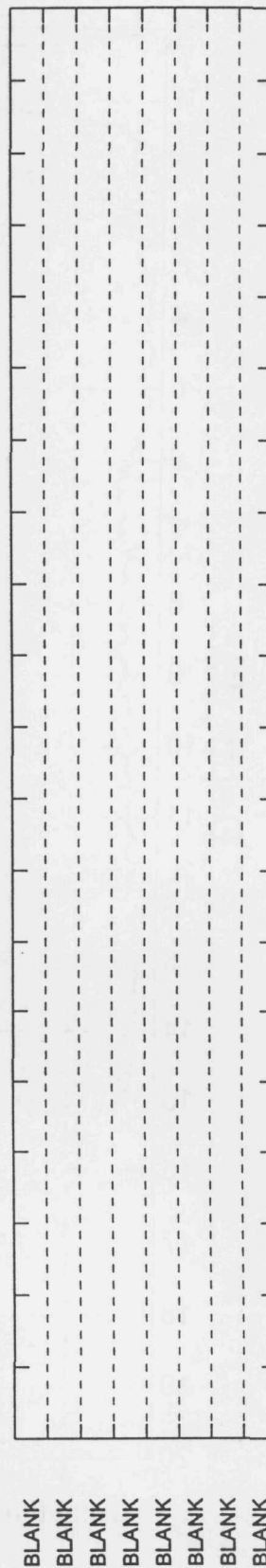
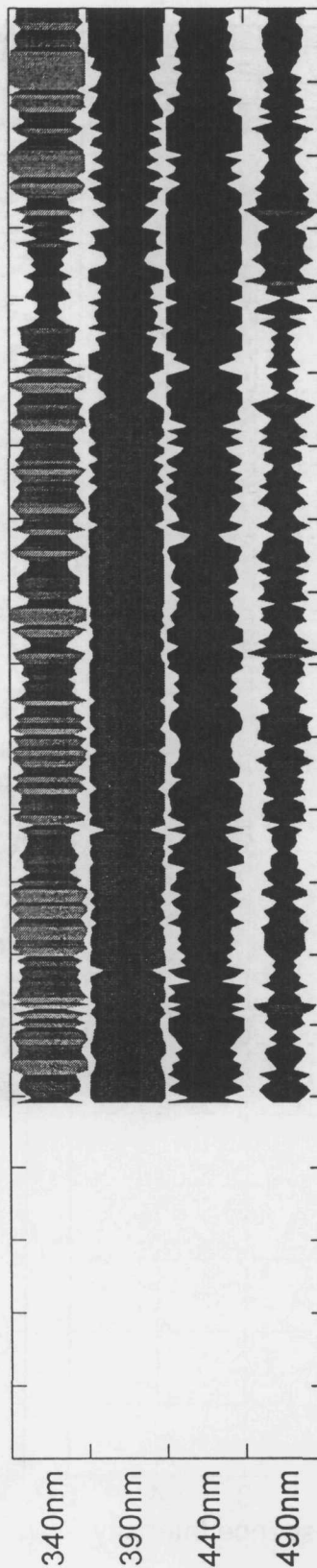
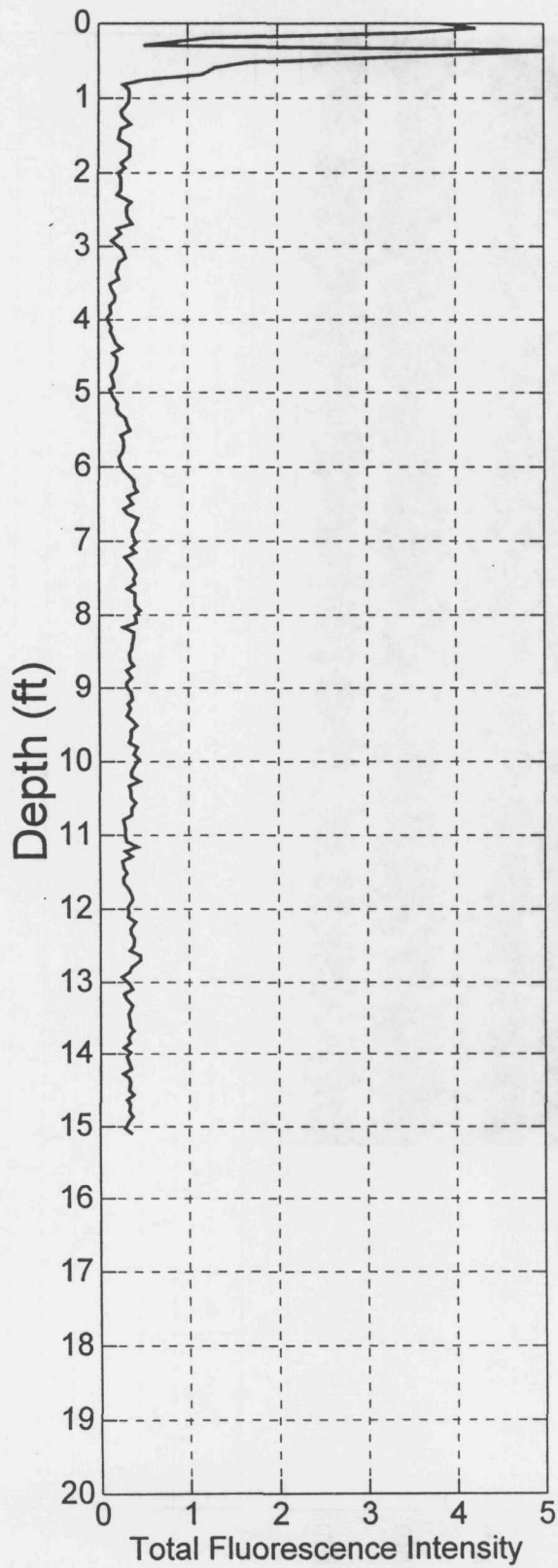
15.09 ft

Measured Peak Fluorescence

5.144%

Job#: 0301-8077

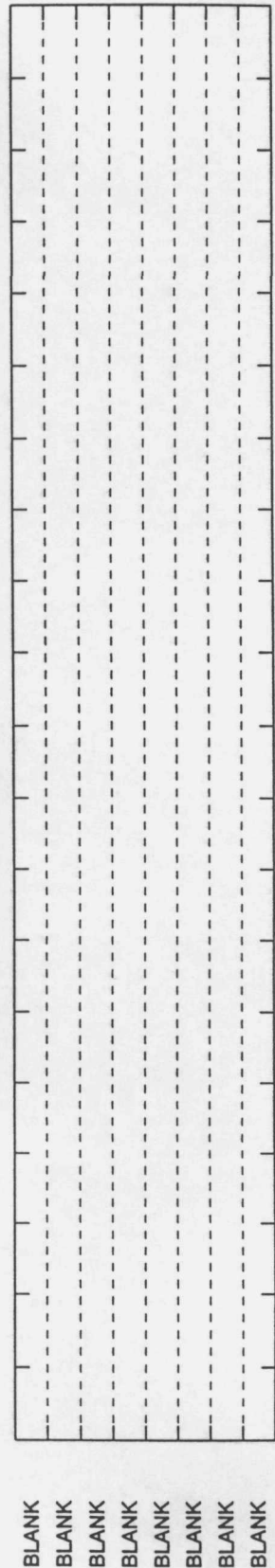
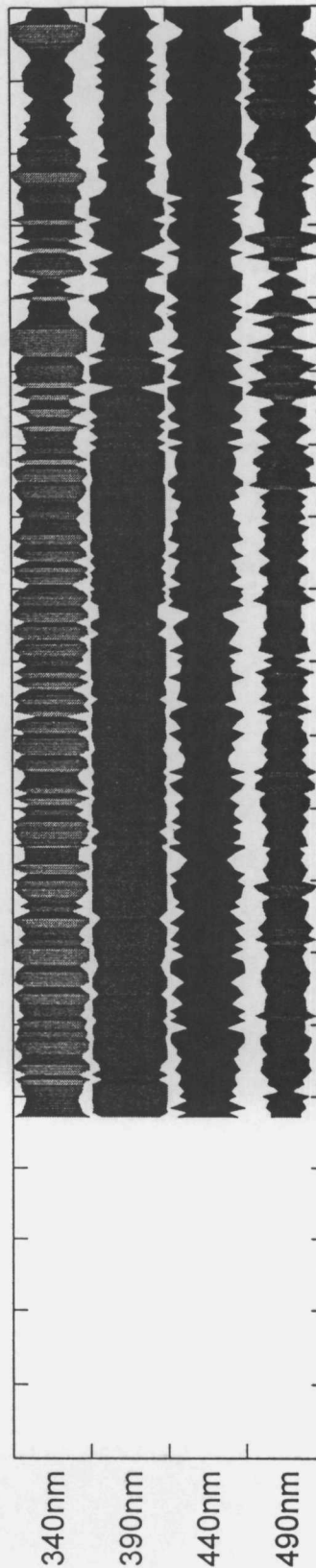
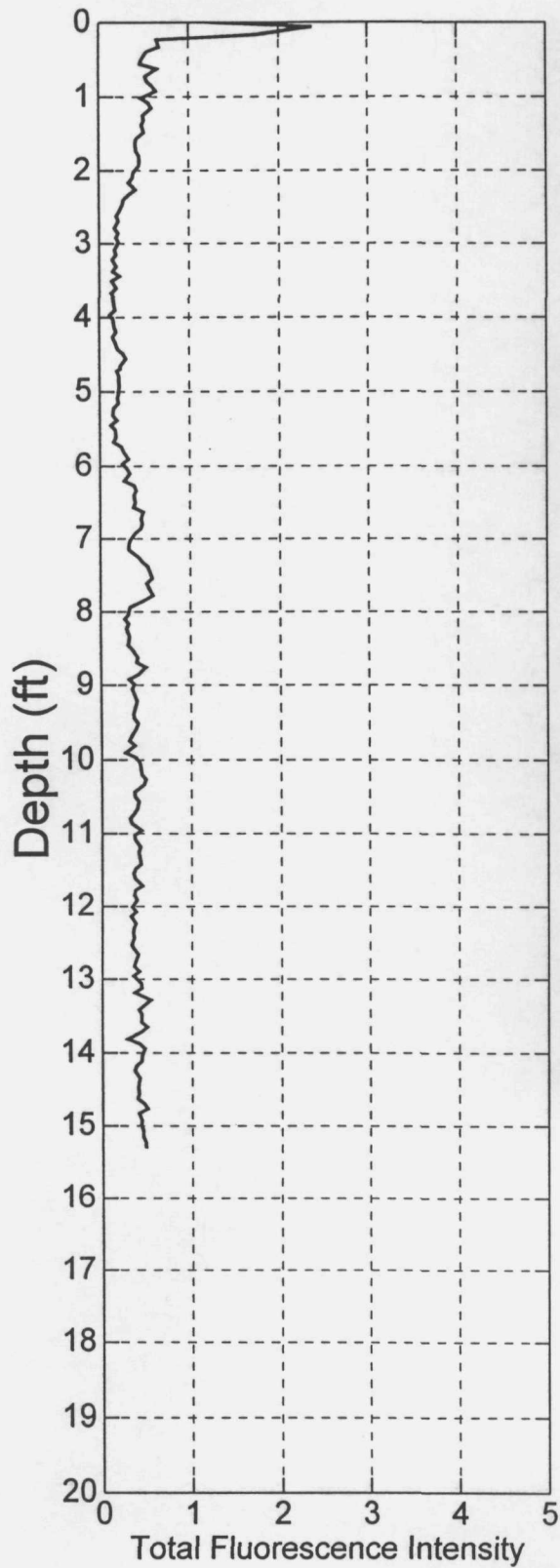
Acquisition Date: 04-30-1998



BG1

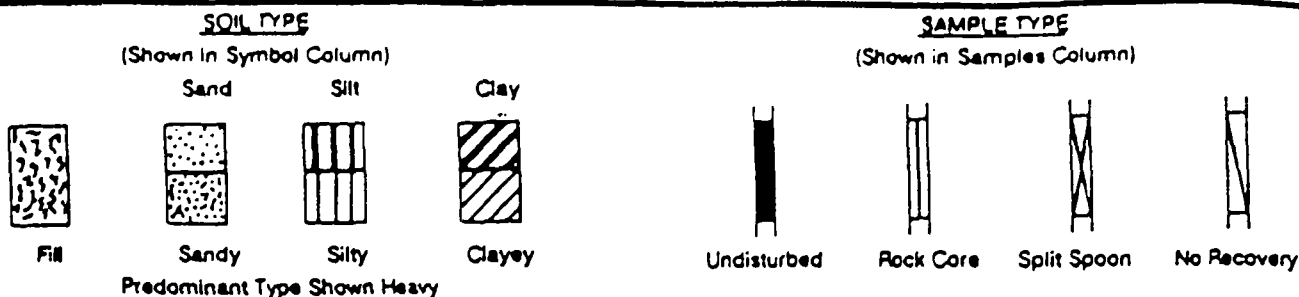
Measured LIF End Depth
15.29 ft
Measured Peak Fluorescence
2.375%

Job#: 0301-8077
Acquisition Date: 04-28-1998



CPT LOGS

Key To Soil Classification and Symbols



TERMS DESCRIBING CONSISTENCY OR CONDITION

COARSE GRAINED SOILS (Major portion Retained on No. 200 Sieve)

Includes (1) clean gravels and sand described as fine, medium or coarse, depending on distribution of grain sizes (2) silty or clayey gravels and sands and (3) fine grained low plasticity soils ($PI < 10$) such as sandy silts. Condition is rated according to relative density, as determined by lab tests or estimated from resistance to sampler penetration.

<u>Descriptive Term</u>	<u>Penetration Resistance*</u>	<u>Relative Density</u>
Loose	0 - 10	0 to 40%
Medium Dense	10 - 30	40 to 70%
Dense	30 - 50	70 to 90%
Very Dense	Over 50	90 to 100%

* Blows/Foot, 140# Hammer, 30" Drop

FINE GRAINED SOILS (Major Portion Passing No. 200 Sieve)

Includes (1) inorganic and organic silts and clays, (2) sandy, gravelly or silty clays, and (3) clayey silts. Consistency is rated according to shearing strength, as indicated by penetrometer readings or by unconfined compression tests for soils with $PI \geq 10$.

<u>Descriptive Term</u>	<u>Cohesive Shear Strength Tons/Square Foot</u>
Very Soft	Less Than 0.125
Soft	0.125 to 0.25
Firm	0.25 to 0.50
Stiff	0.50 to 1.00
Very Stiff	1.00 to 2.00
Hard	2.00 and Higher

Note: Slickensided and fissured clay may have lower unconfined compressive strengths than shown above because of planes of weakness or shrinkage cracks; consistency ratings of such soils are based on hand penetrometer readings.

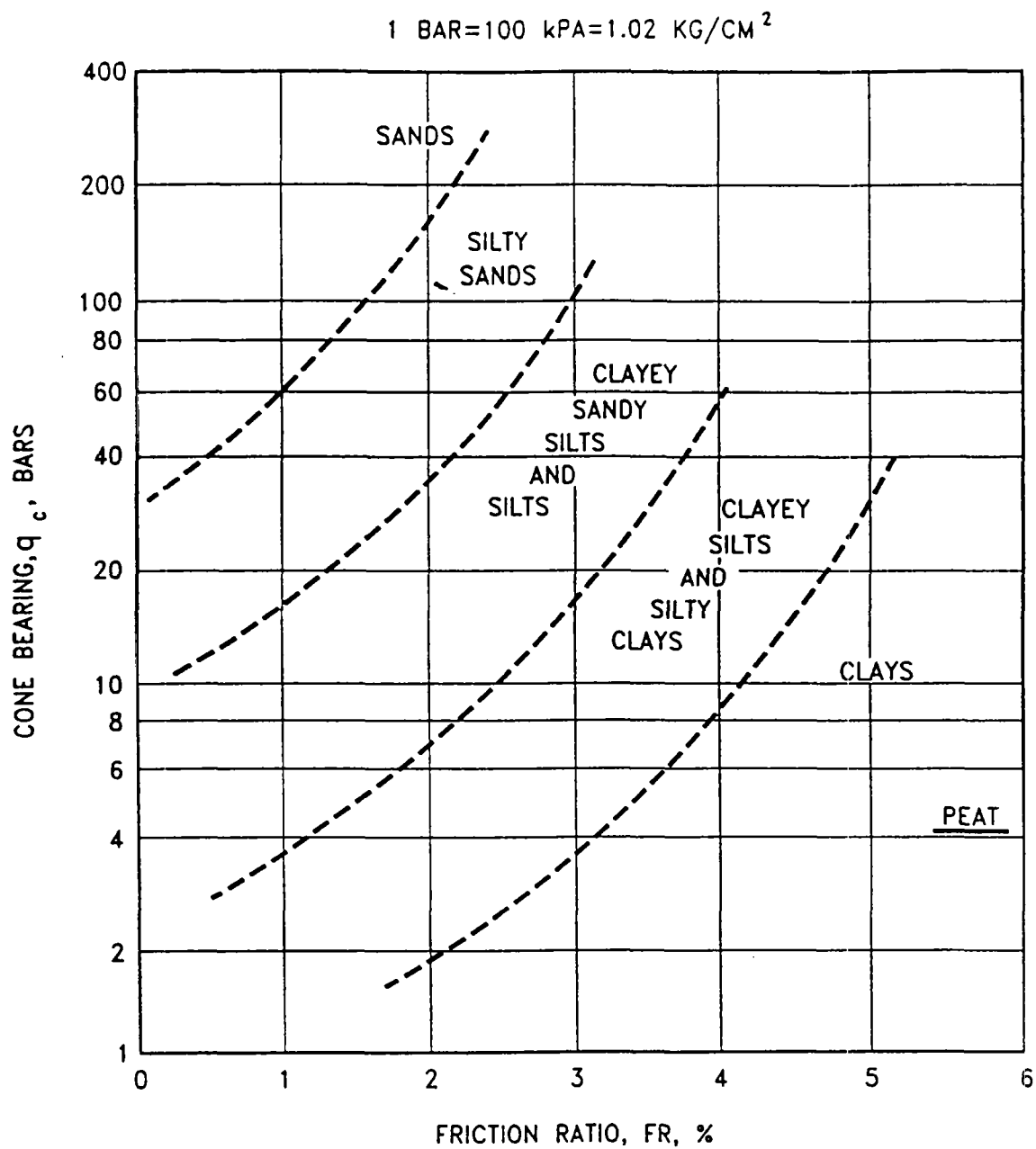
TERMS CHARACTERIZING SOIL STRUCTURE

Parting:	paper thin in size
Seam:	1/8" to 3" thick
Layer:	greater than 3"
Fissured:	containing shrinkage cracks, frequently filled with fine sand or silt, usually more or less vertical
Sensitive:	pertaining to cohesive soils that are subject to appreciable loss of strength when remolded
Interbedded:	composed of alternate layers of different soil types
Laminated:	composed of thin layers of varying color and texture
Calcareous:	containing appreciable quantities of calcium carbonate
Well Graded:	having wide range in grain sizes and substantial amounts of all intermediate particle sizes
Poorly Graded:	predominantly of one grain size, or having a range of sizes with some intermediate size missing

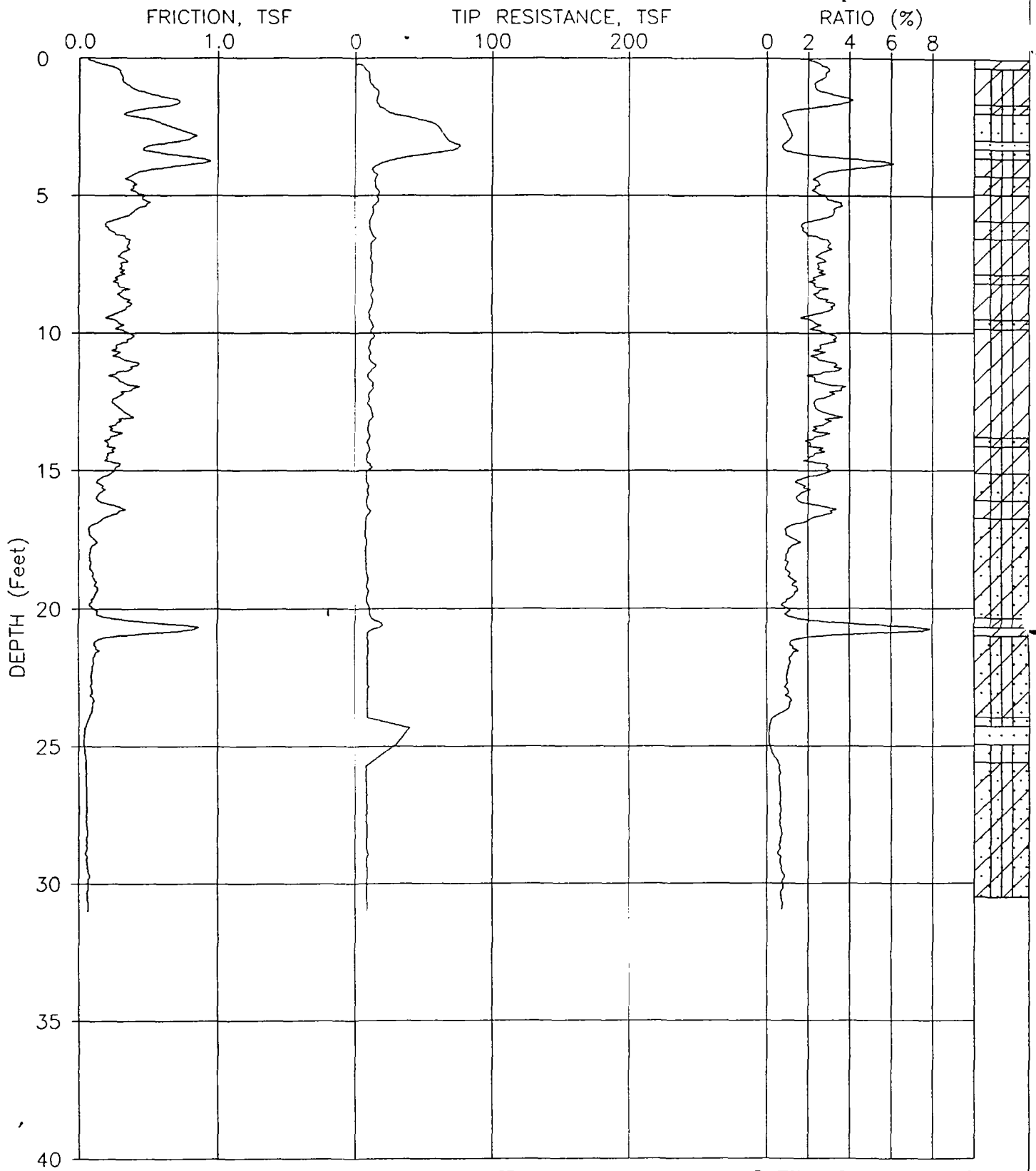
Flocculated:	pertaining to cohesive soils that exhibit a loose knit or flakey structure
Slickensided:	having inclined planes of weakness that are slick and glossy in appearance.

Degree of Slickensided Development

Slightly Slickensided:	slickensides present at intervals of 1' to 2', soil does not easily break along these planes
Moderately Slickensided:	slickensides spaced at intervals of 1' to 2', soil breaks easily along these planes
Extremely Slickensided:	continuous and interconnected slickensides spaced at intervals of 4" to 12', soil breaks along the slickensides into pieces 3" to 6" in size
Intensely Slickensided:	slickensides spaced at intervals of less than 4", continuous in all directions, breaks down along planes into nodules 1/4" to 2" in size.



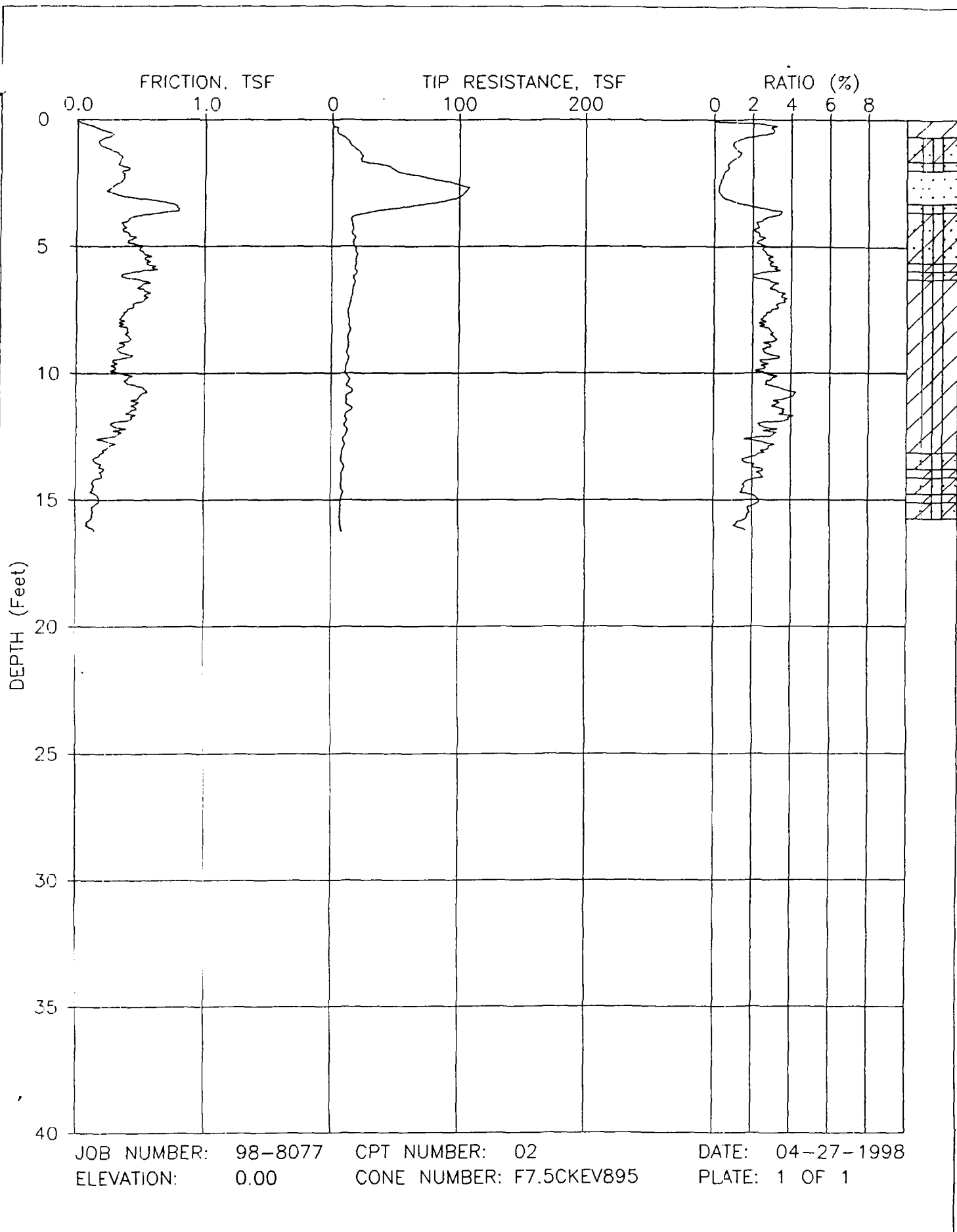
**ROBERTSON AND CAMPANELLA SIMPLIFIED SOIL
BEHAVIOR CHART (1983)**

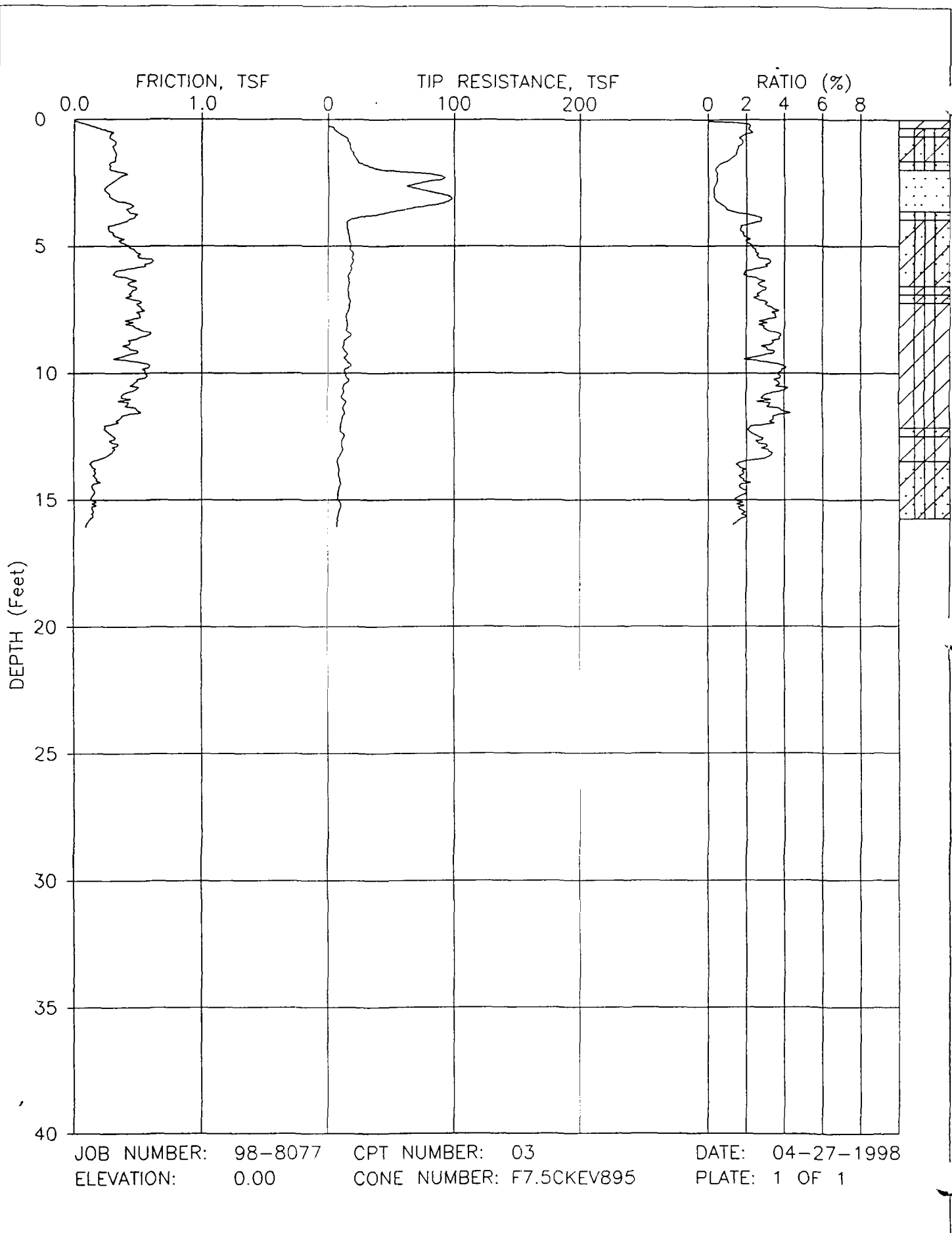


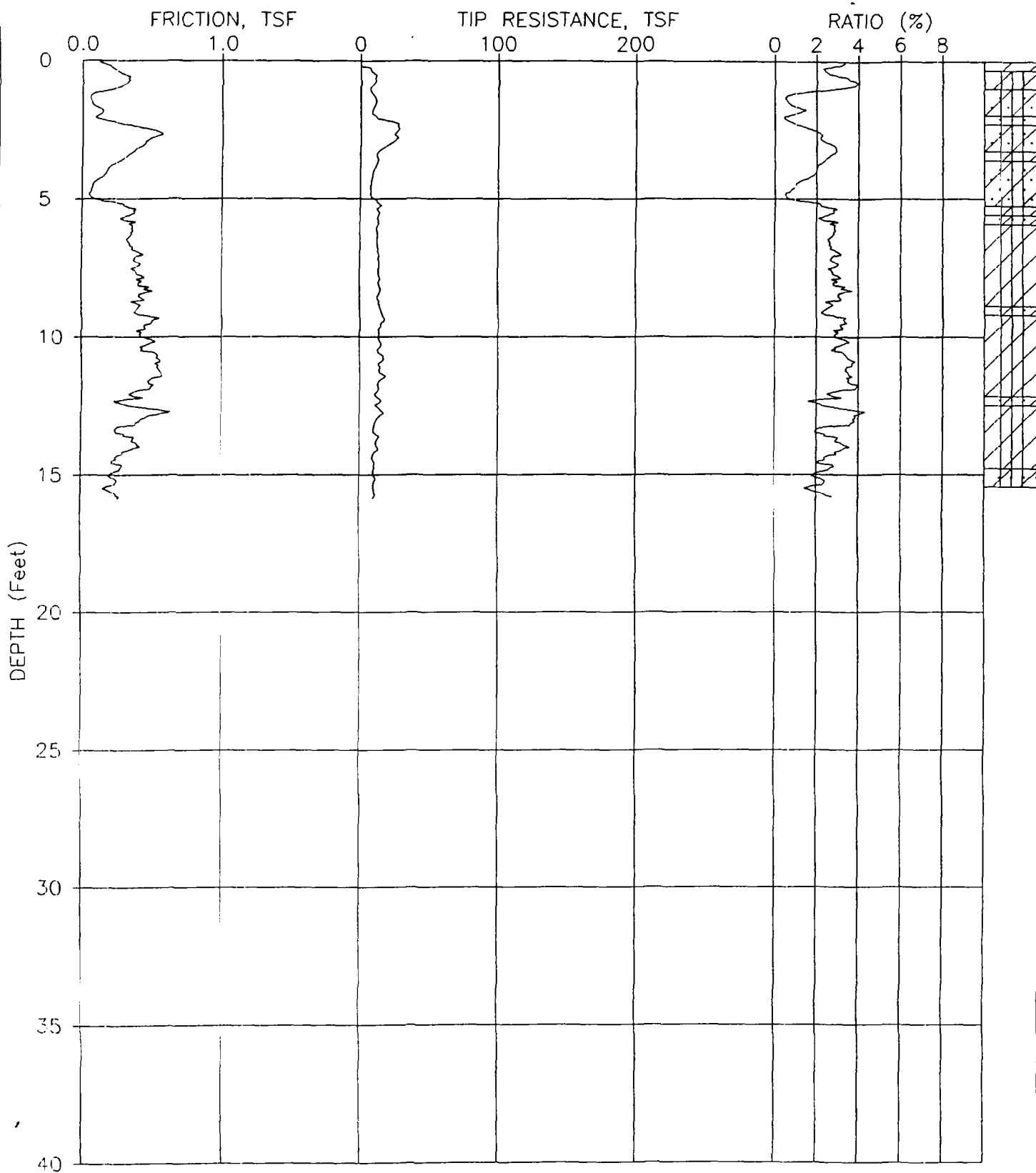
JOB NUMBER: 98-8077
ELEVATION: 0.00

CPT NUMBER: 01
CONE NUMBER: F7.5CKEV895

DATE: 04-27-1998
PLATE: 1 OF 1



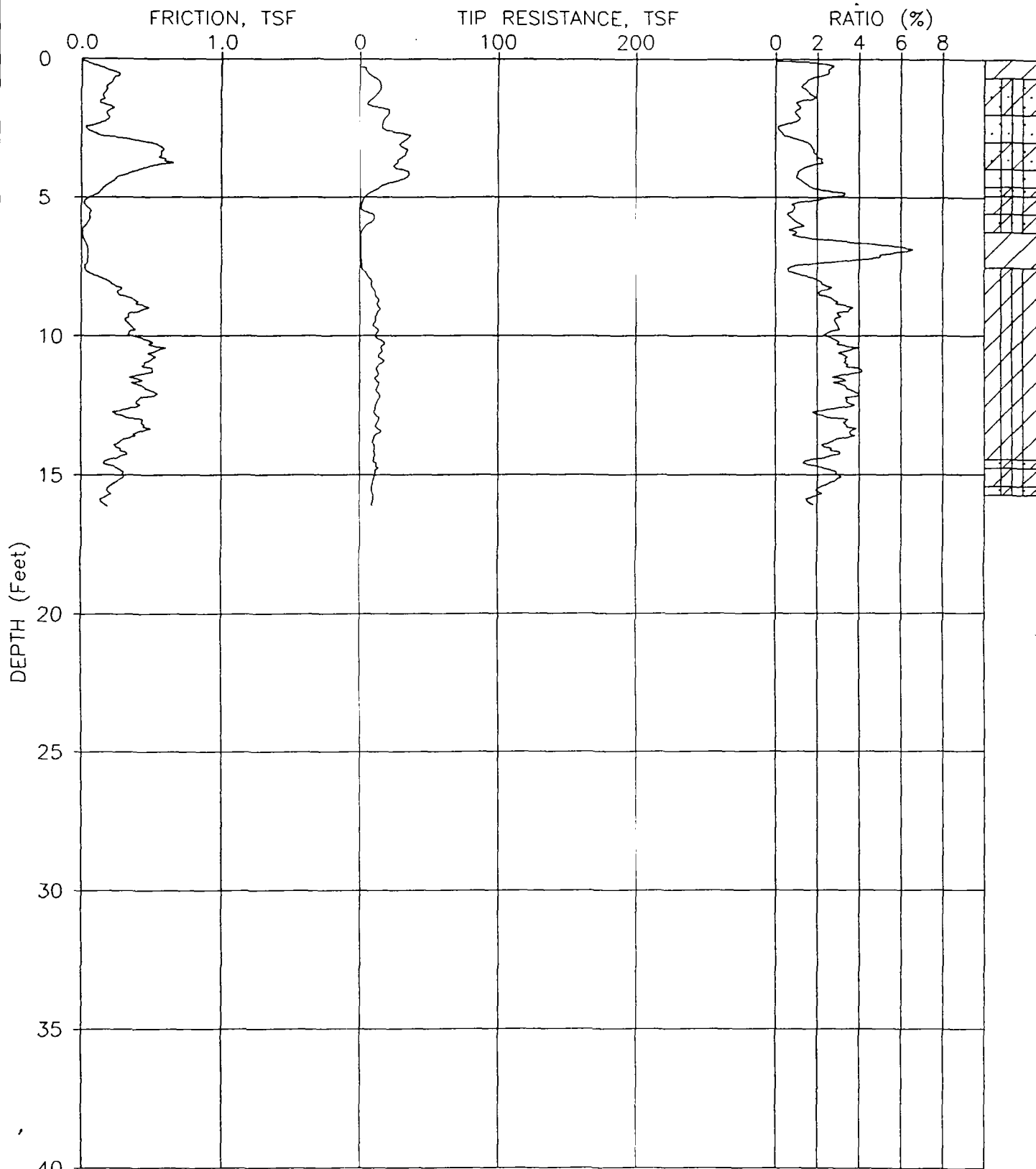




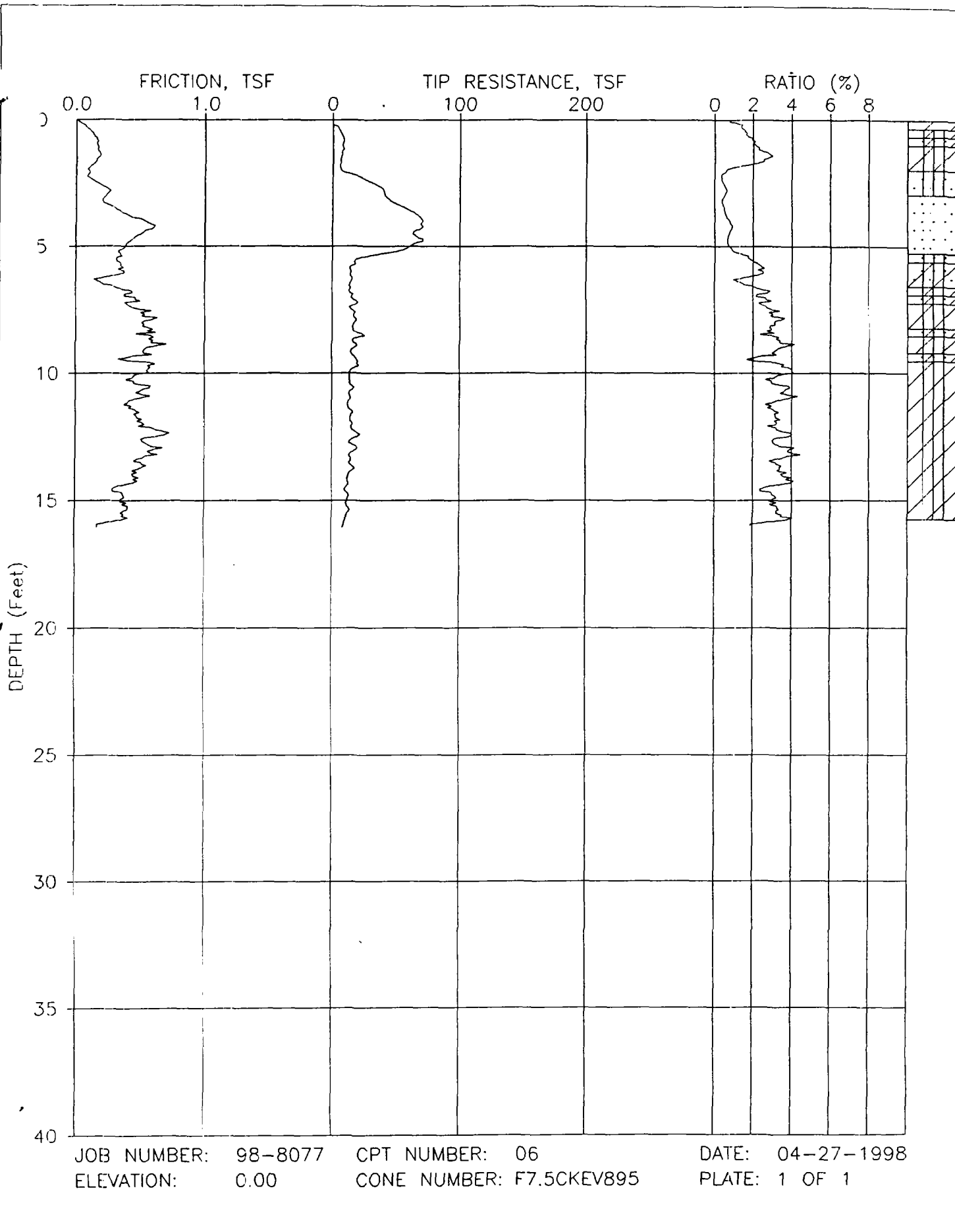
JCB NUMBER: 98-8077
ELEVATION: 0.00

CPT NUMBER: 04
CONE NUMBER: F7.5CKEV895

DATE: 04-27-1998
PLATE: 1 OF 1



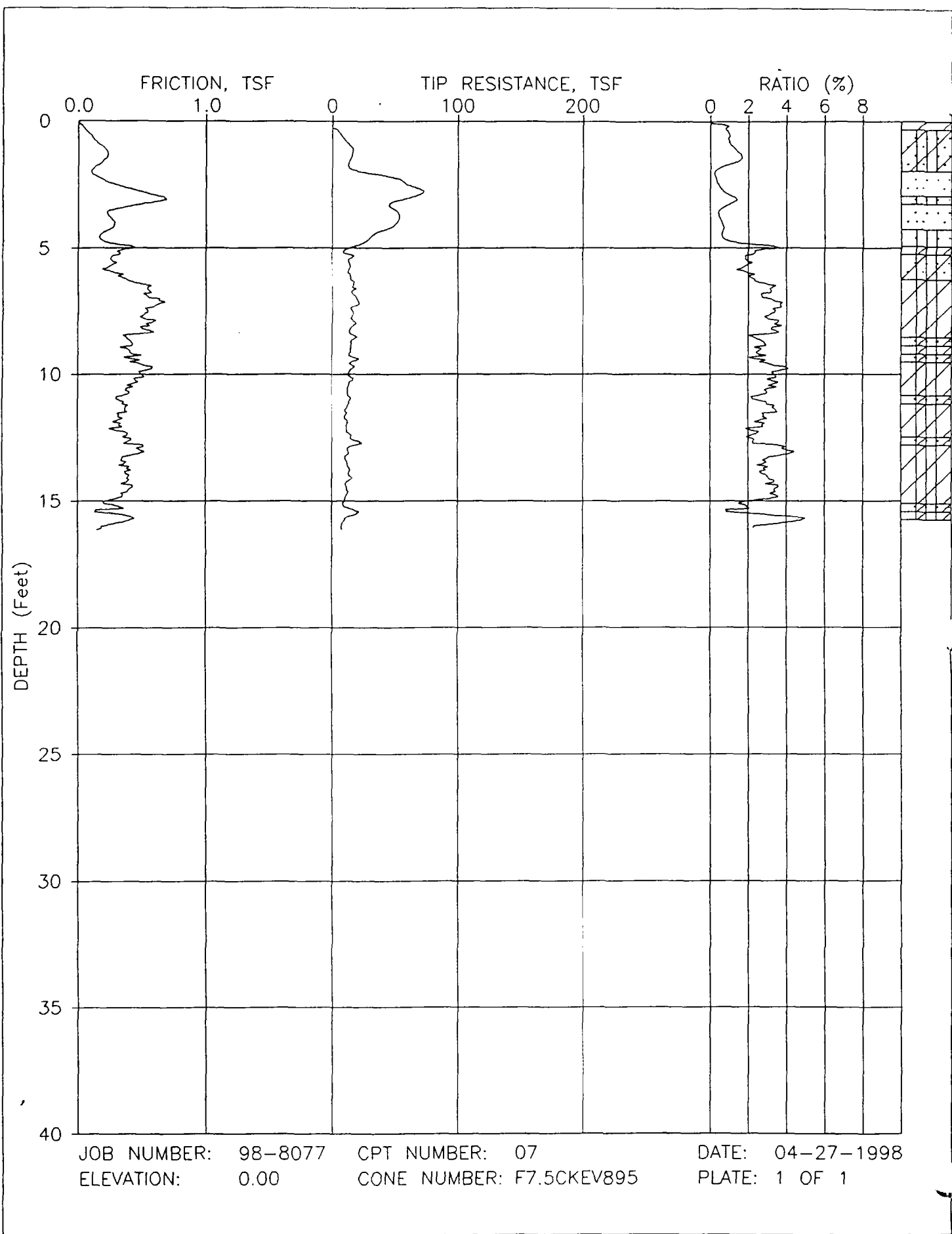
JOB NUMBER: 98-8077 CPT NUMBER: 05 DATE: 04-27-1998
ELEVATION: 0.00 CONE NUMBER: F7.5CKEV895 PLATE: 1 OF 1

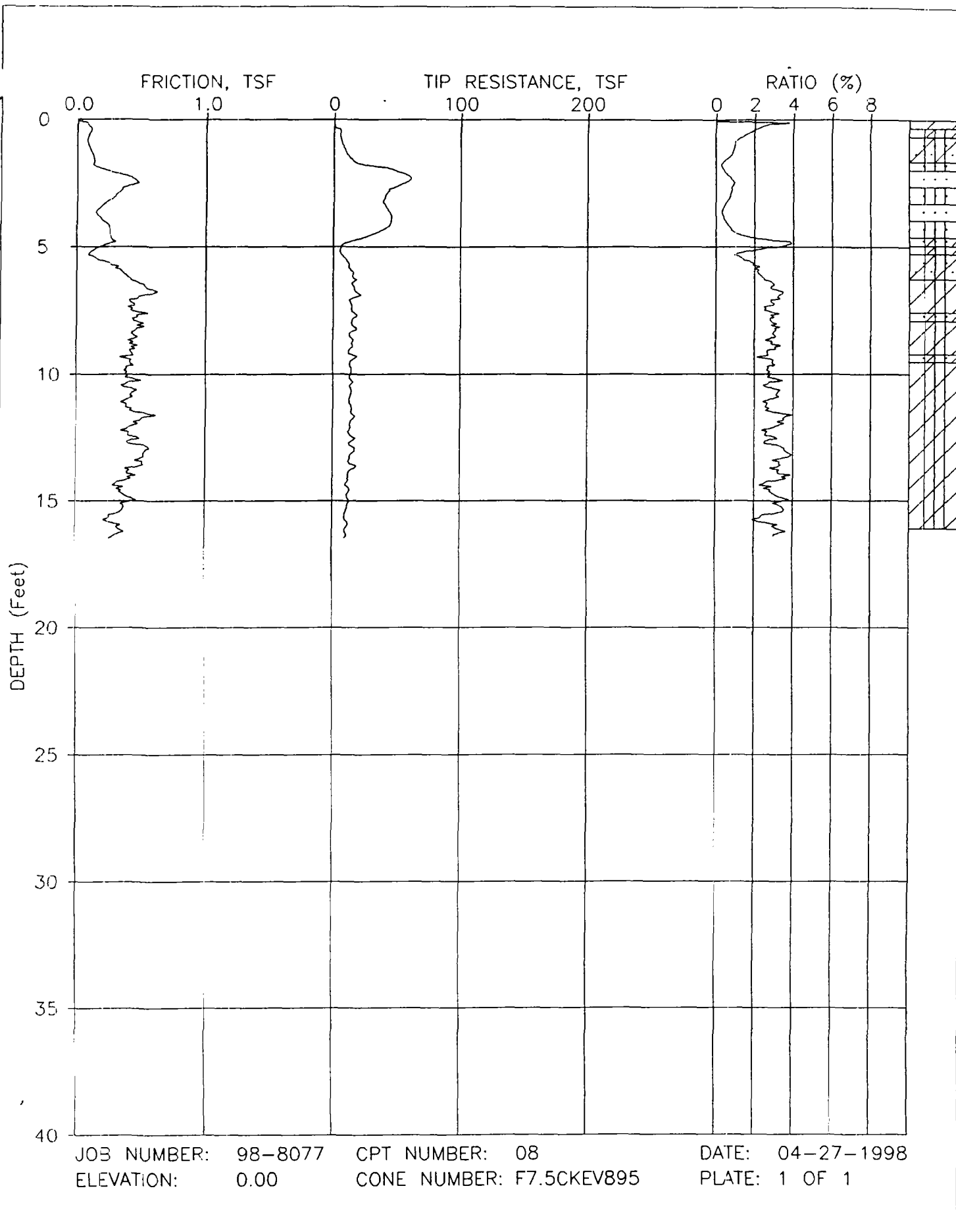


JOB NUMBER: 98-8077
ELEVATION: 0.00

CPT NUMBER: 06
CONE NUMBER: F7.5CKEV895

DATE: 04-27-1998
PLATE: 1 OF 1

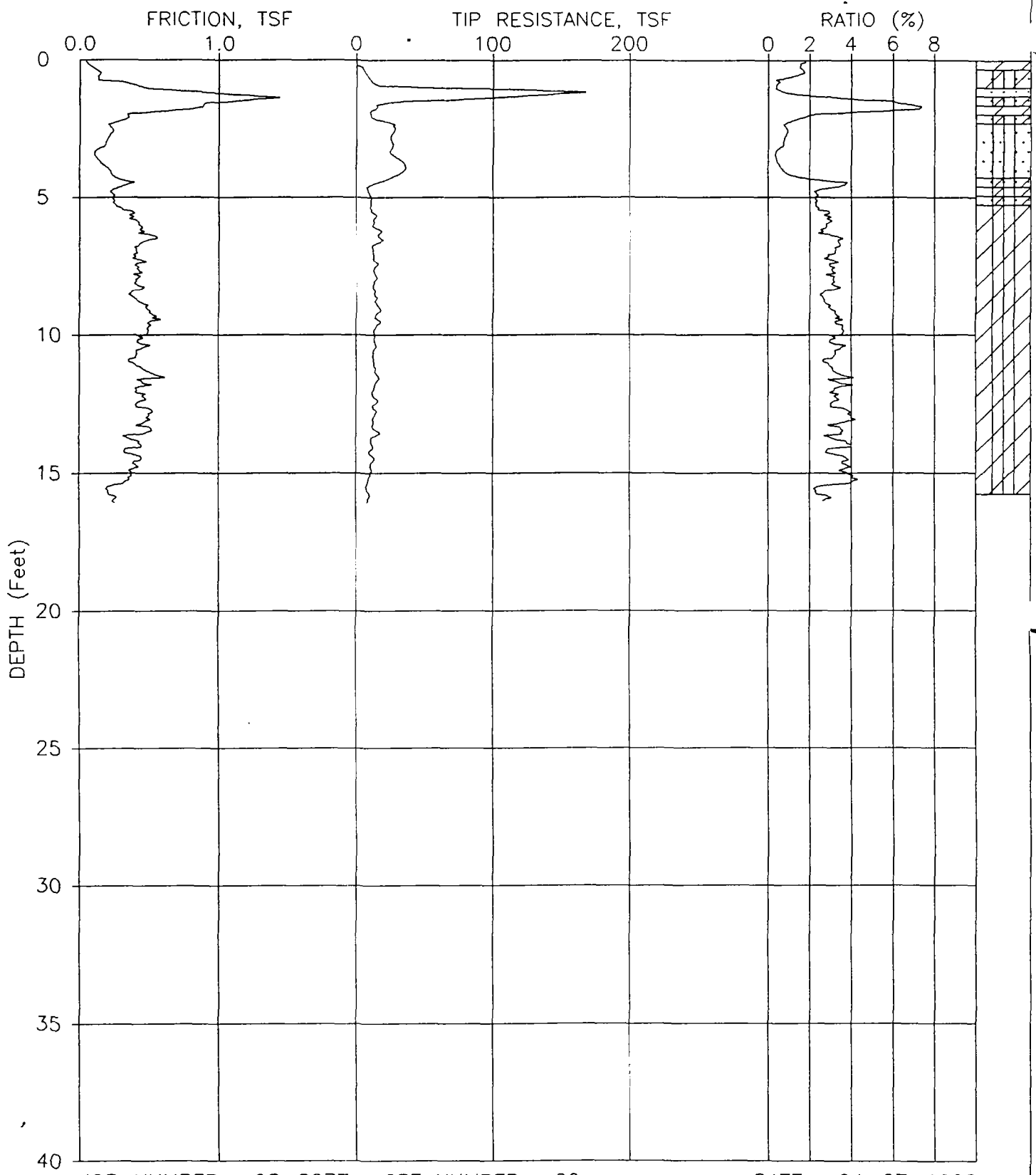




JOB NUMBER: 98-8077
ELEVATION: 0.00

CPT NUMBER: 08
CONE NUMBER: F7.5CKEV895

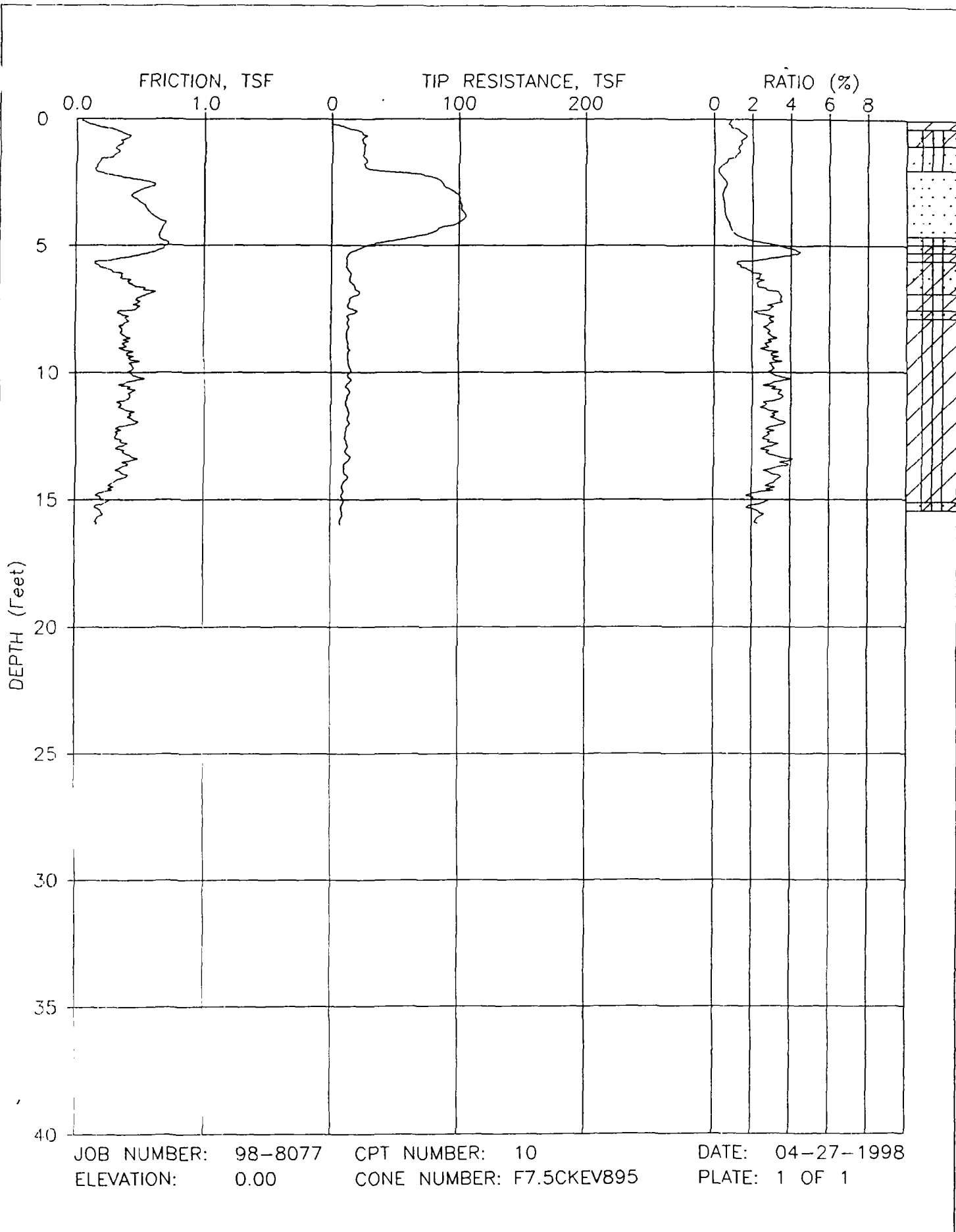
DATE: 04-27-1998
PLATE: 1 OF 1



JOB NUMBER: 98-8077
ELEVATION: 0.00

CPT NUMBER: 09
CONE NUMBER: F7.5CKEV895

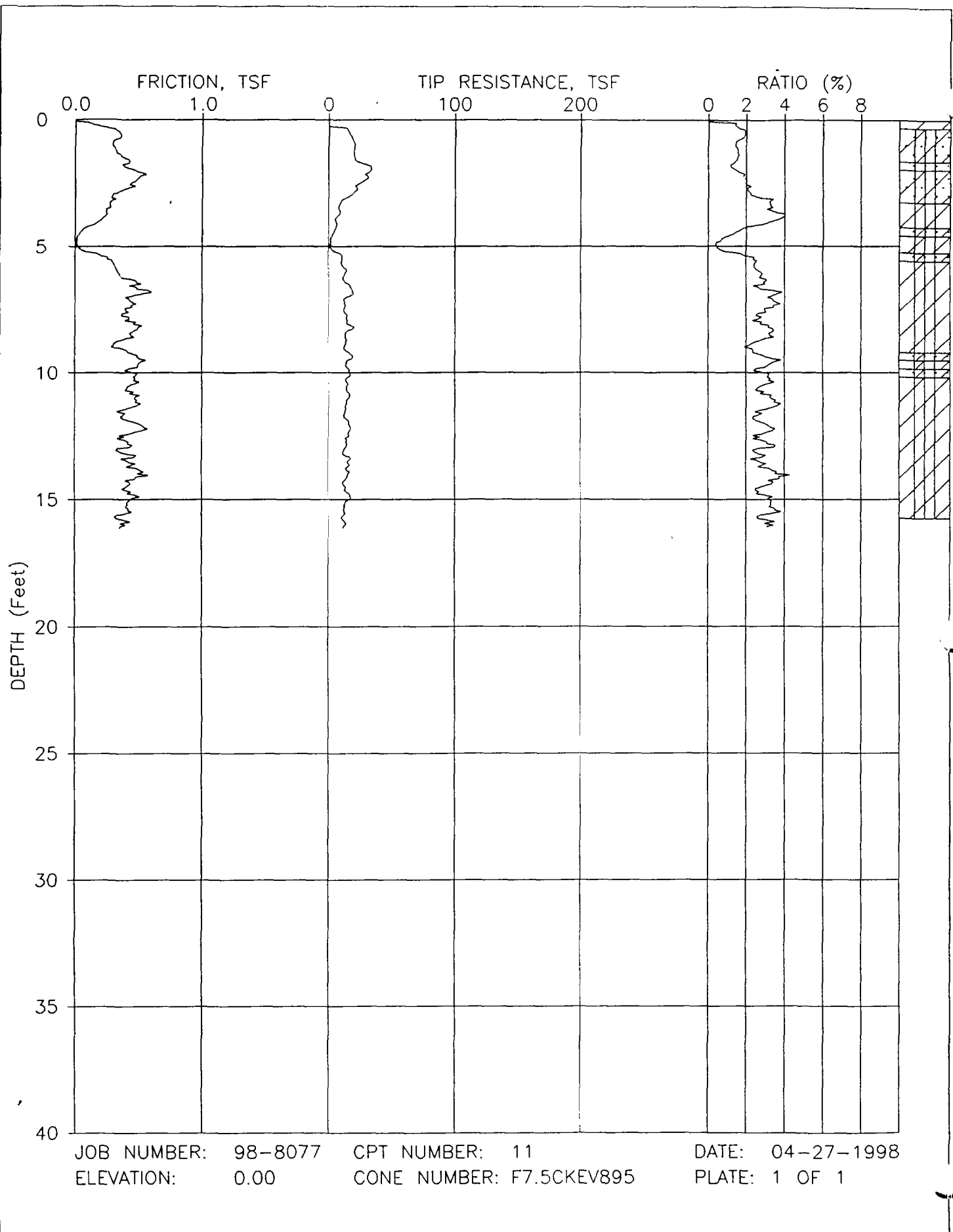
DATE: 04-27-1998
PLATE: 1 OF 1

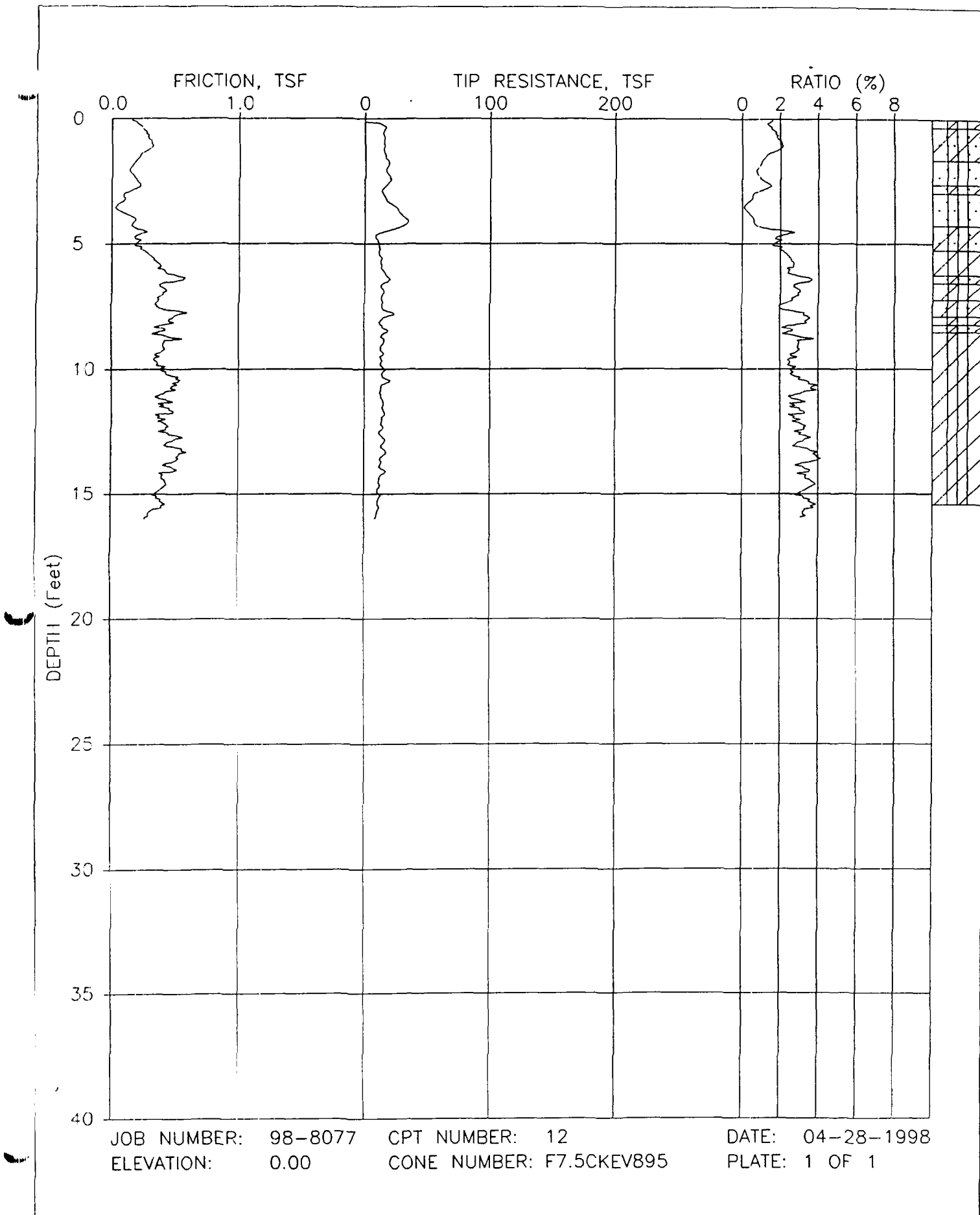


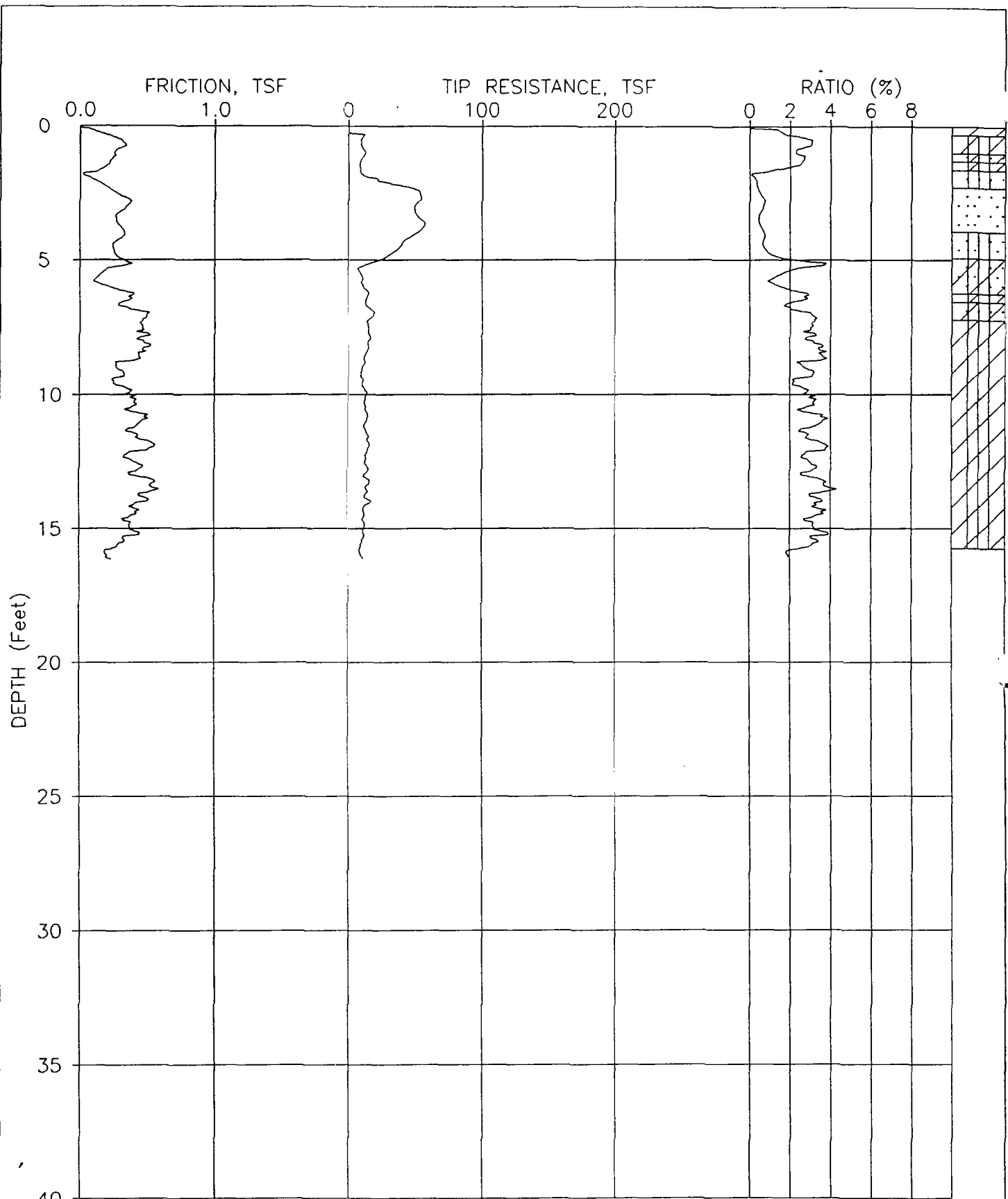
JOB NUMBER: 98-8077
ELEVATION: 0.00

CPT NUMBER: 10
CONE NUMBER: F7.5CKEV895

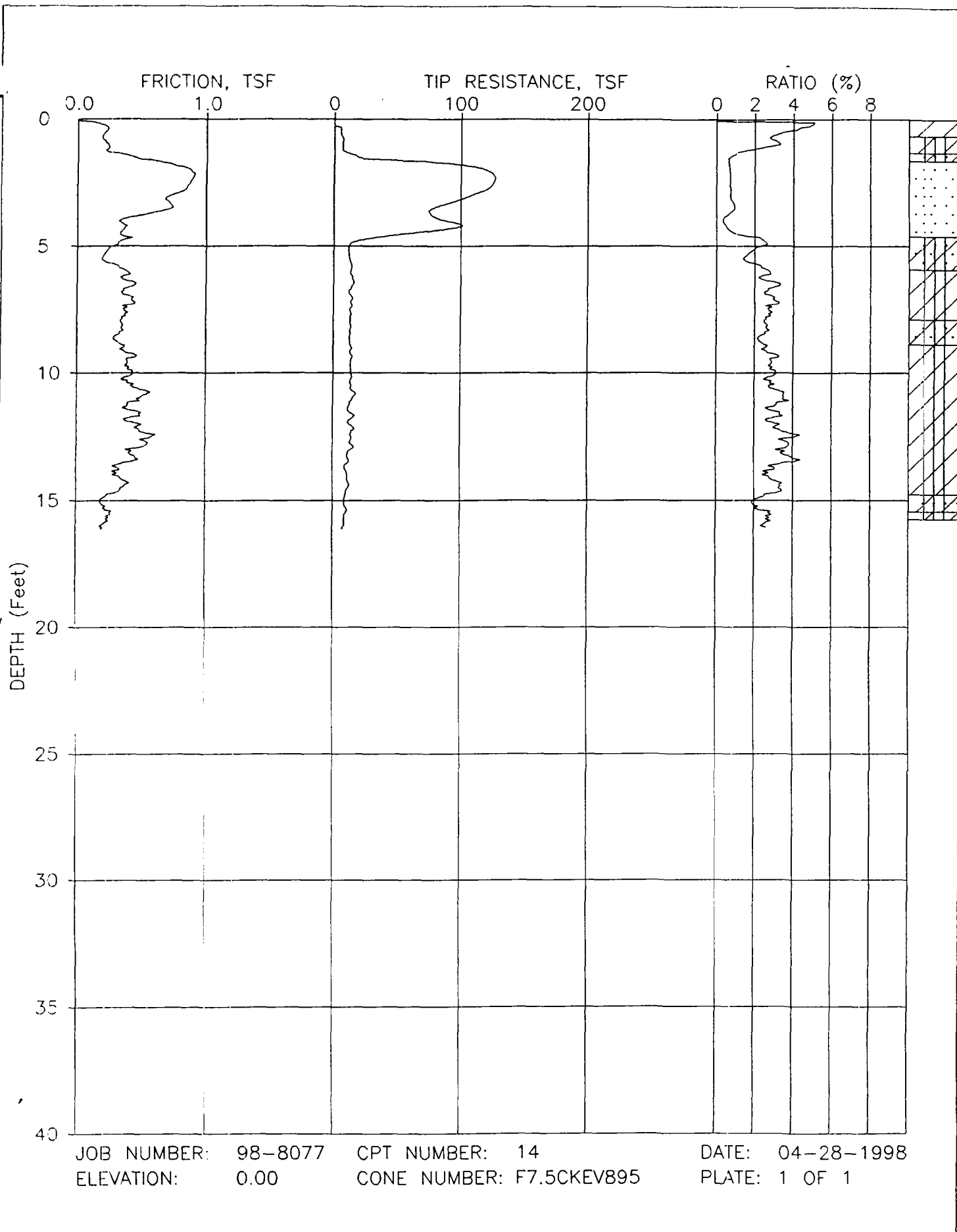
DATE: 04-27-1998
PLATE: 1 OF 1







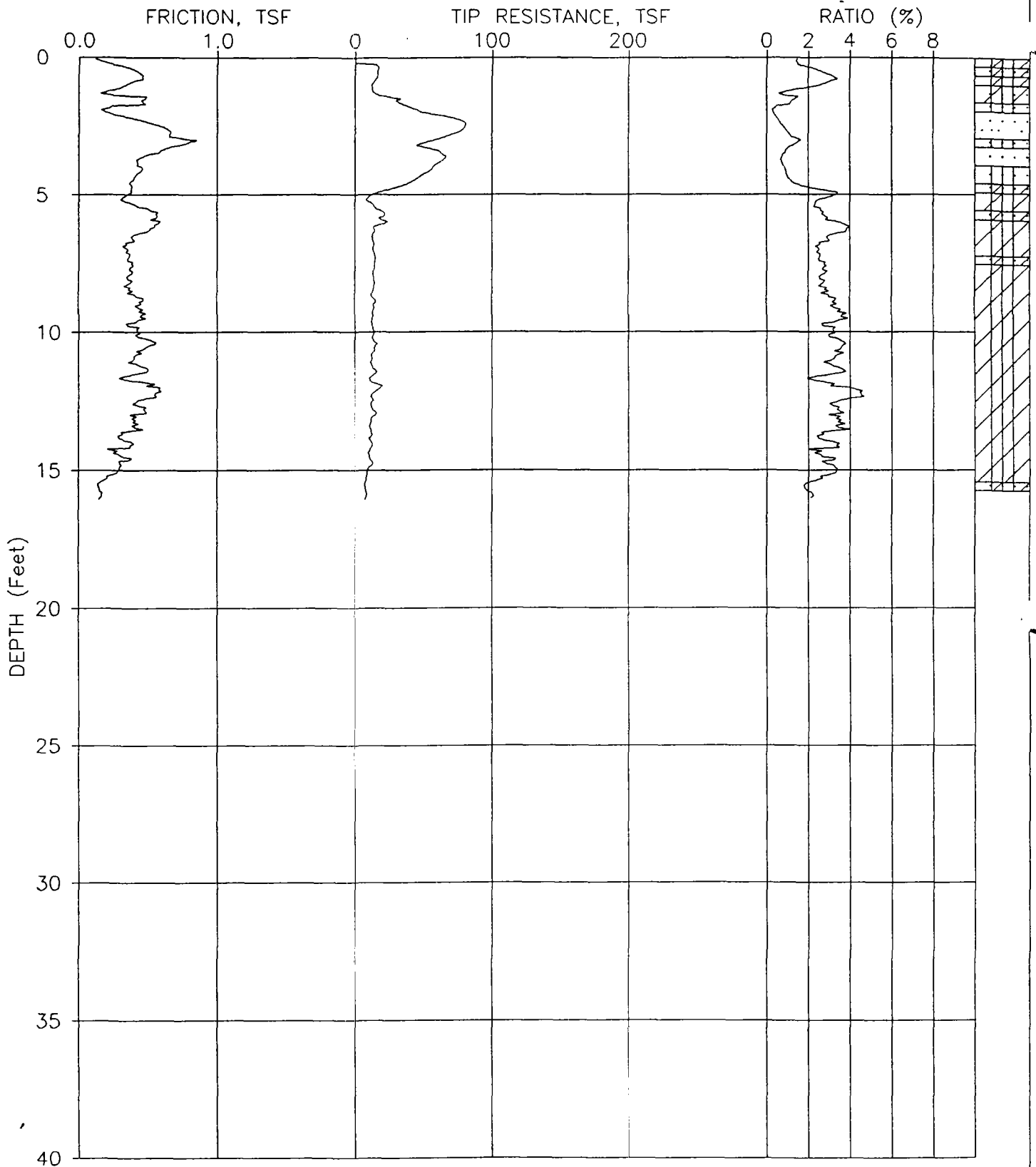
JOB NUMBER: 98-8077 CPT NUMBER: 13 DATE: 04-28-1998
ELEVATION: 0.00 CONE NUMBER: F7.5CKEV895 PLATE: 1 OF 1



JOB NUMBER: 98-8077
ELEVATION: 0.00

CPT NUMBER: 14
CONE NUMBER: F7.5CKEV895

DATE: 04-28-1998
PLATE: 1 OF 1



JOB NUMBER: 98-8077

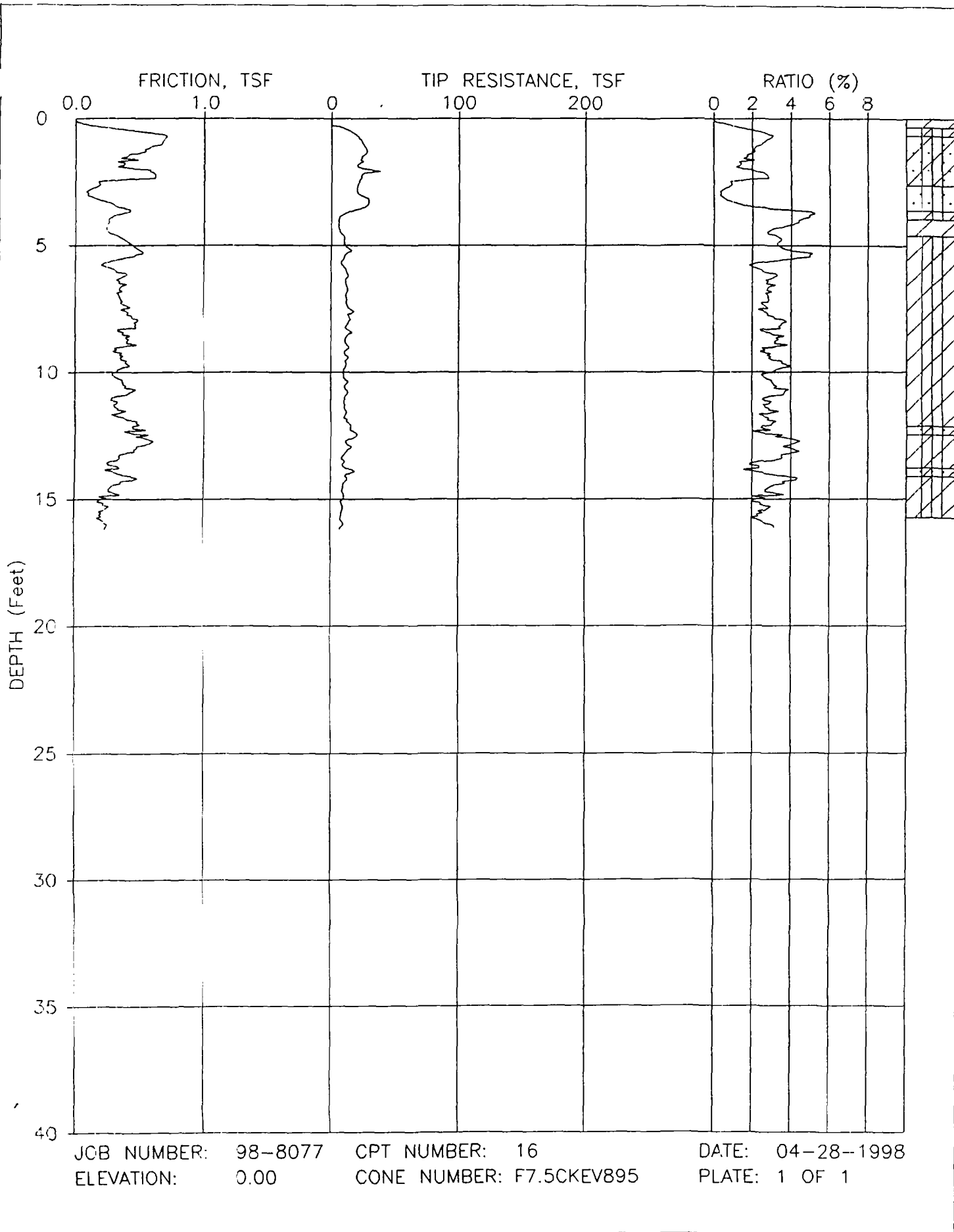
CPT NUMBER: 15

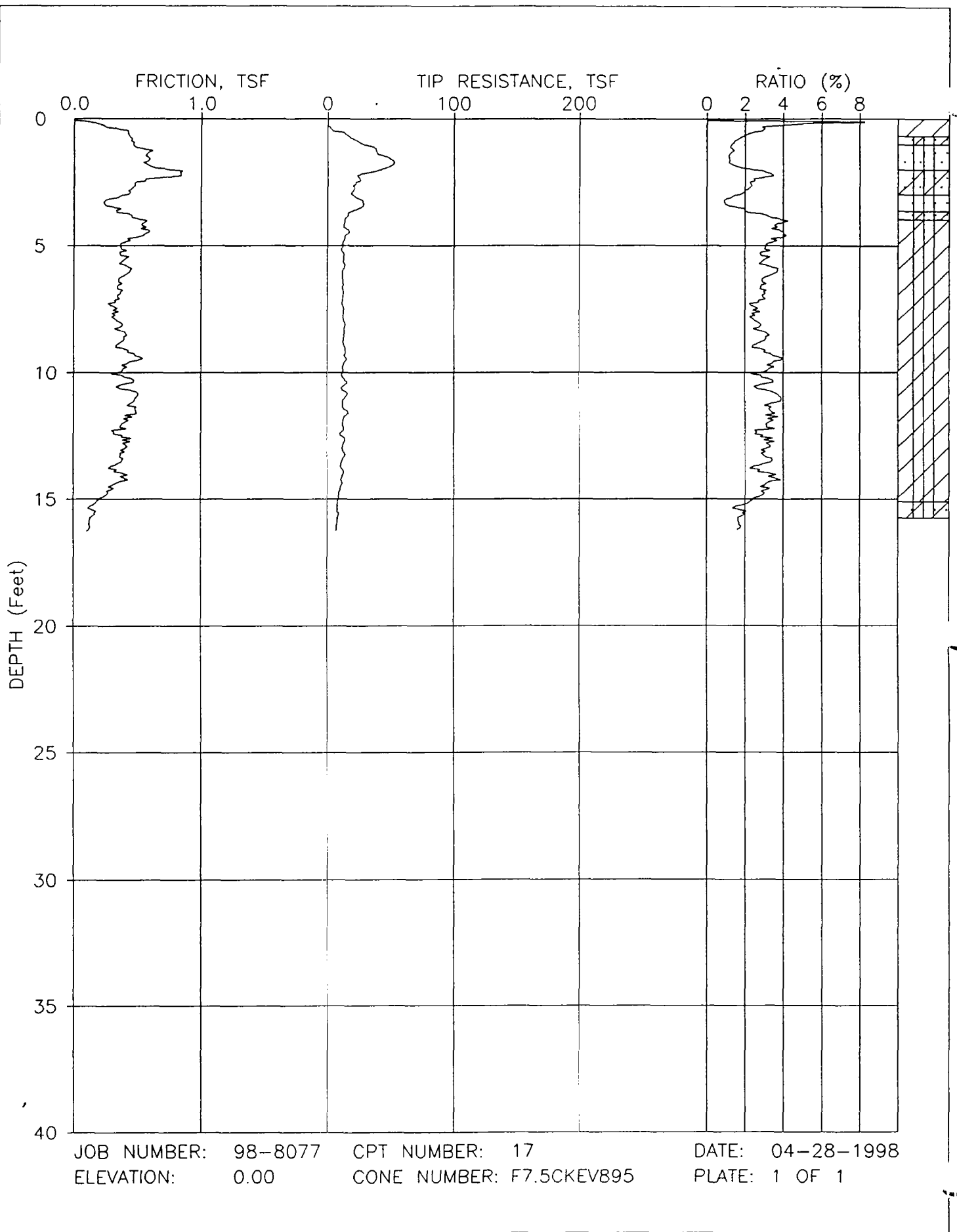
DATE: 04-28-1998

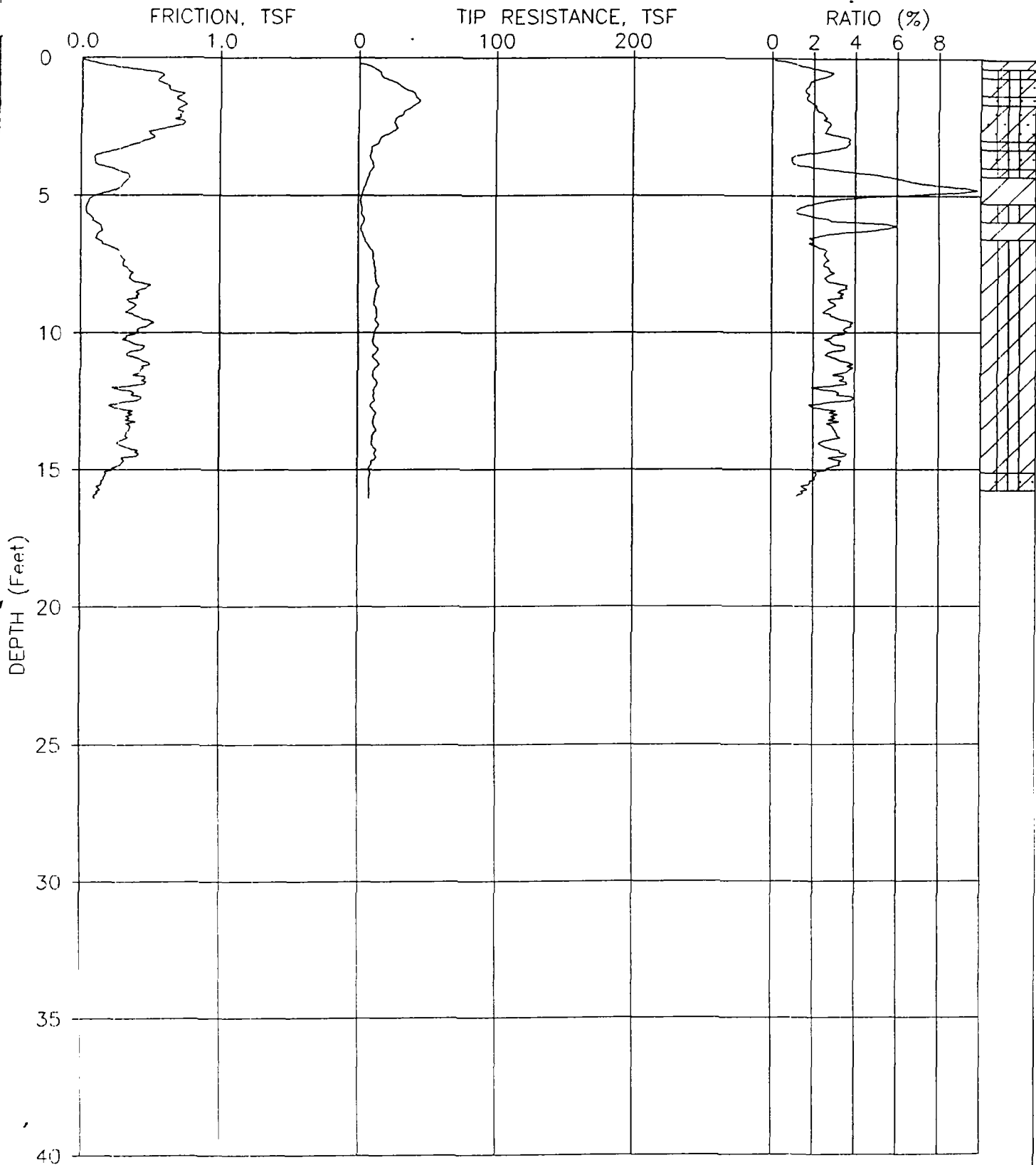
ELEVATION: 0.00

CONE NUMBER: F7.5CKEV895

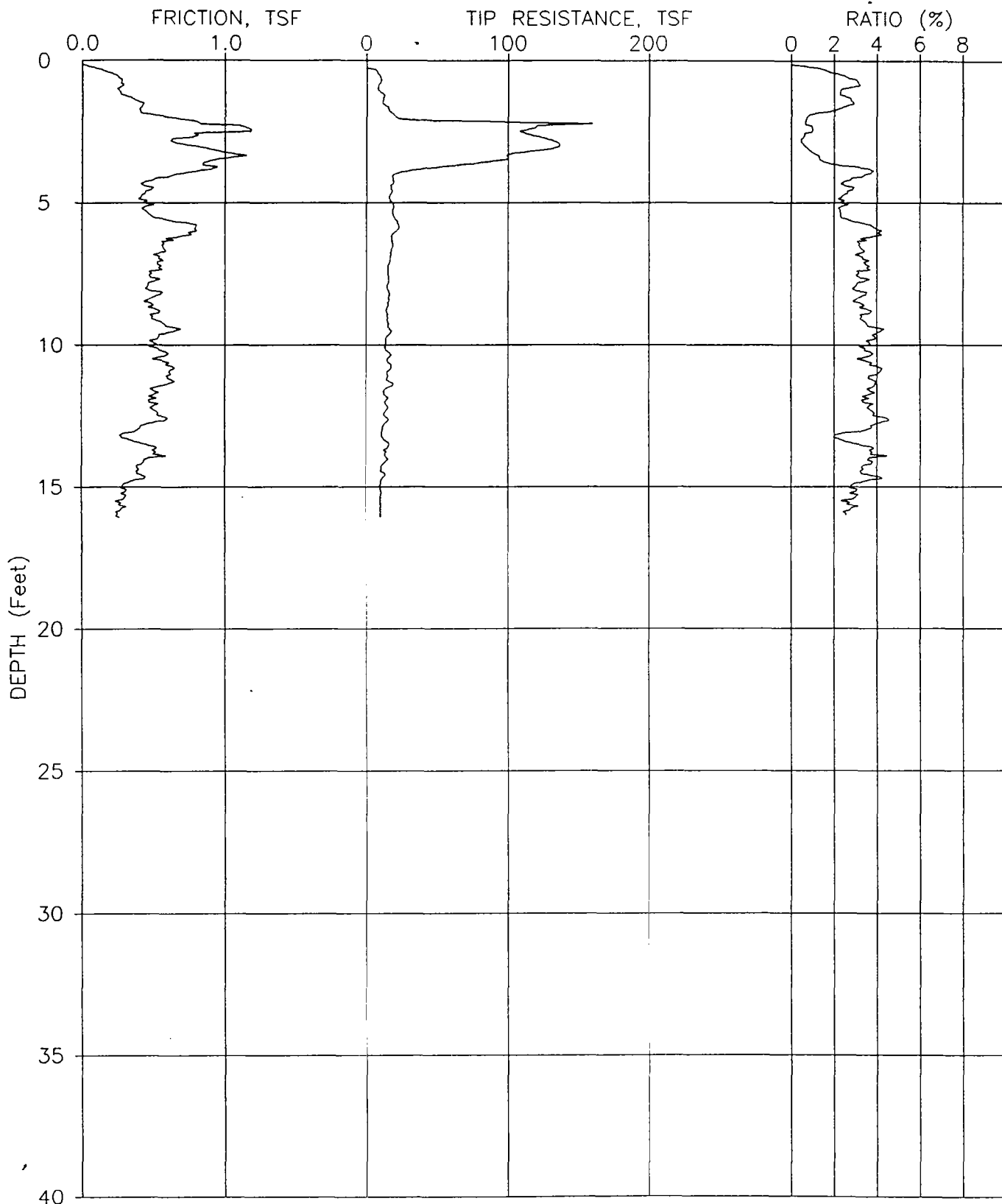
PLATE: 1 OF 1







JOB NUMBER: 98-8077 CPT NUMBER: 17A DATE: 04-28-1998
ELEVATION: 0.00 CONE NUMBER: F7.5CKEV895 PLATE: 1 OF 1



JOB NUMBER: 98-8077

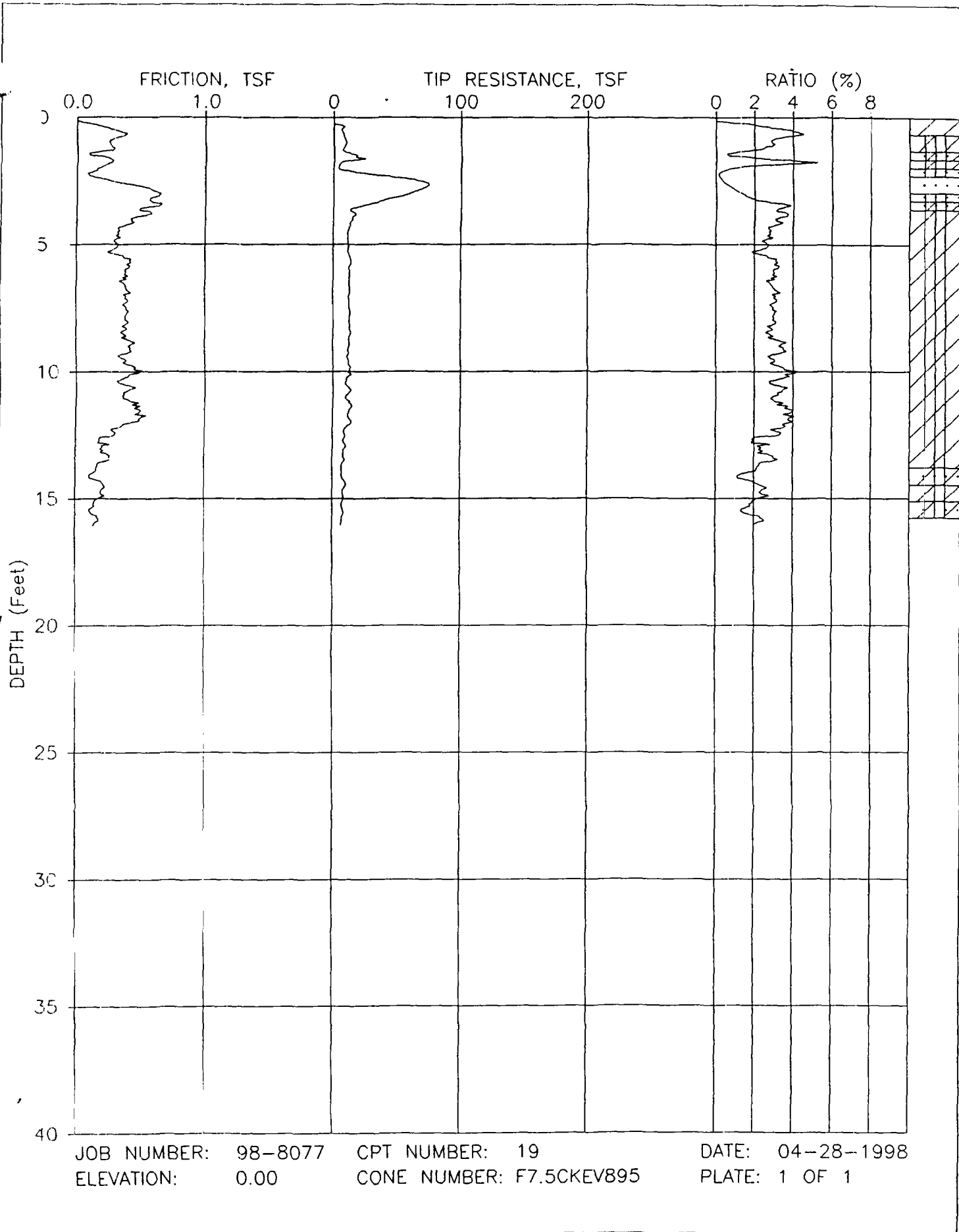
CPT NUMBER: 18

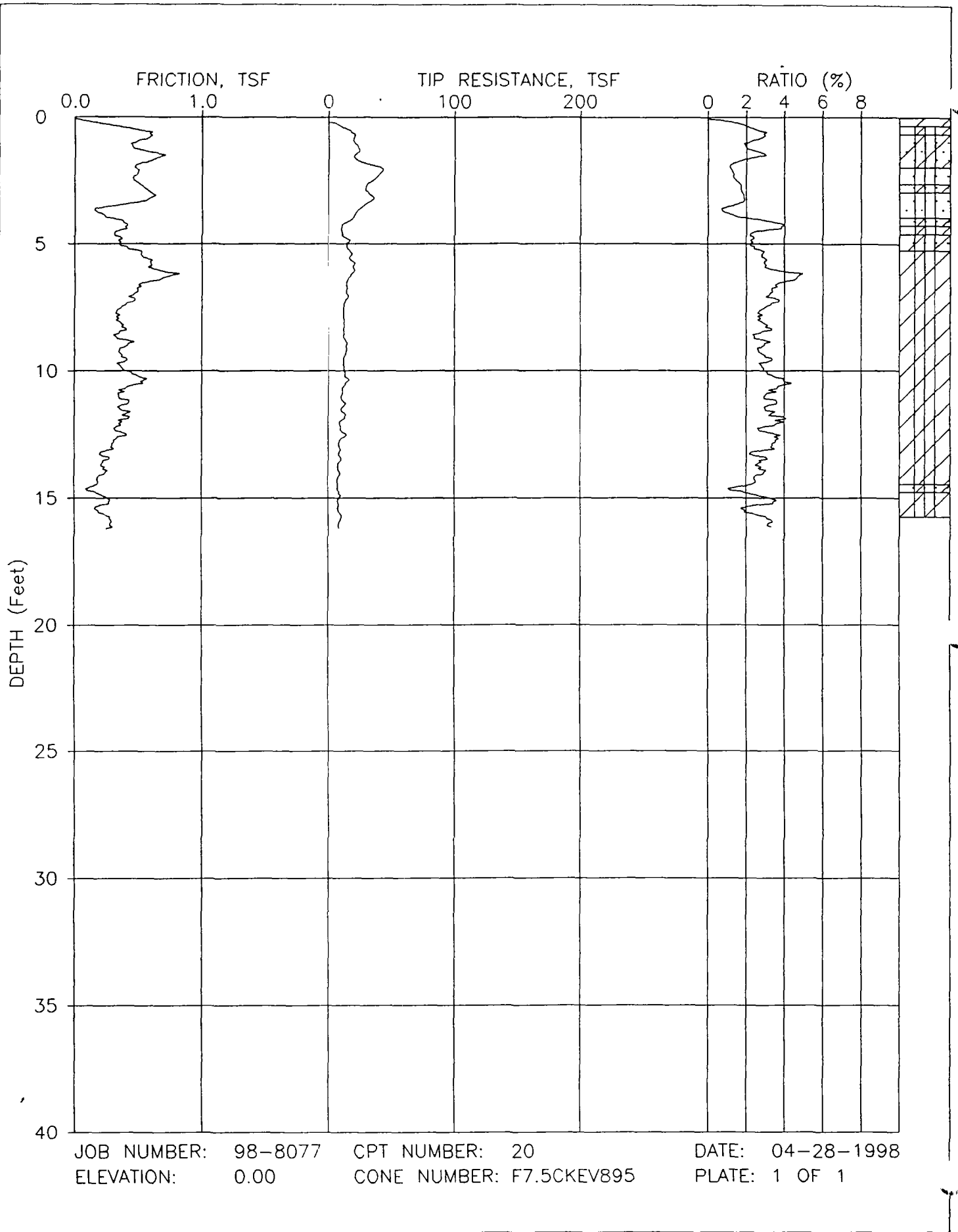
DATE: 04-28-1998

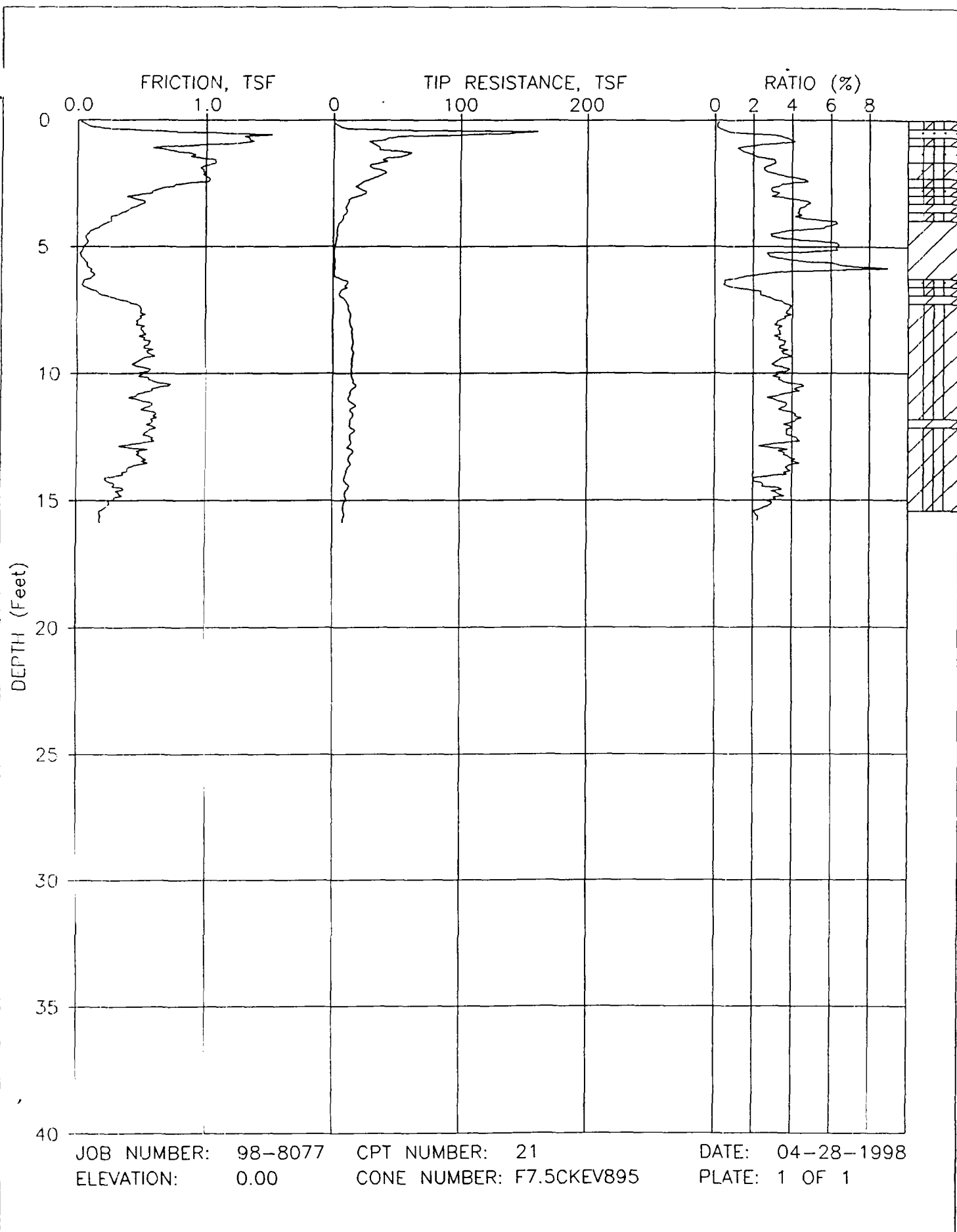
ELEVATION: 0.00

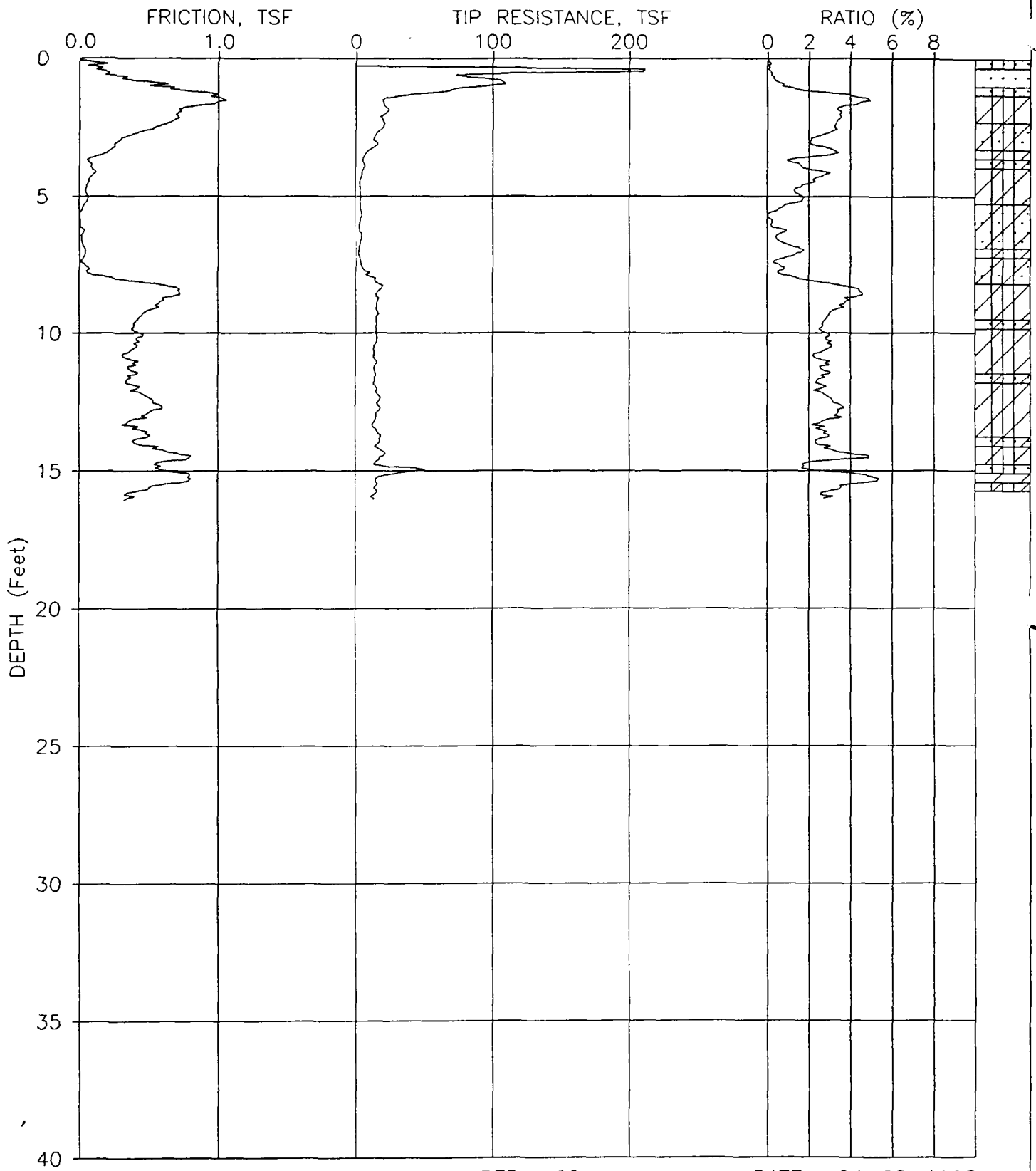
CONE NUMBER: F7.5CKEV895

PLATE: 1 OF 1





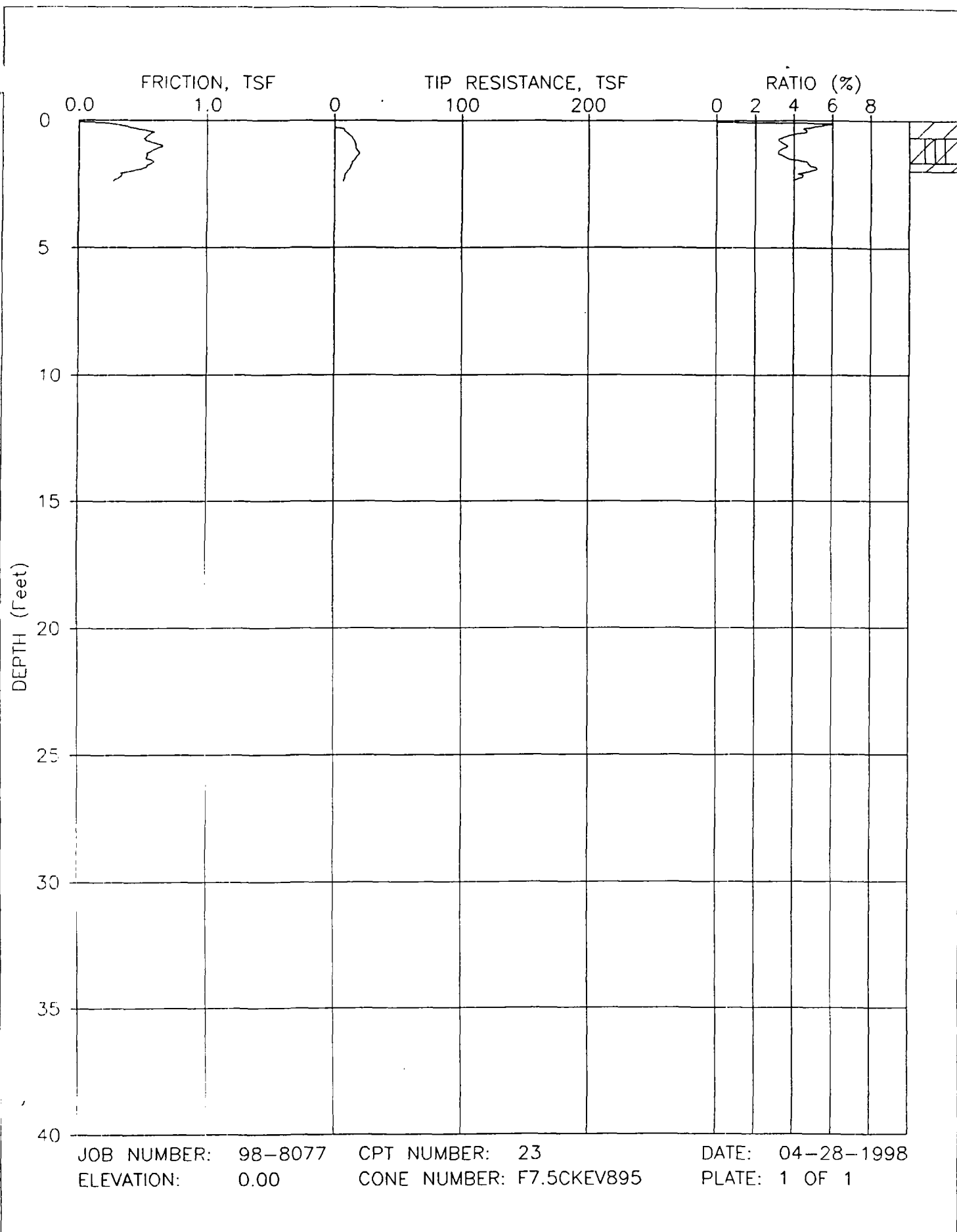


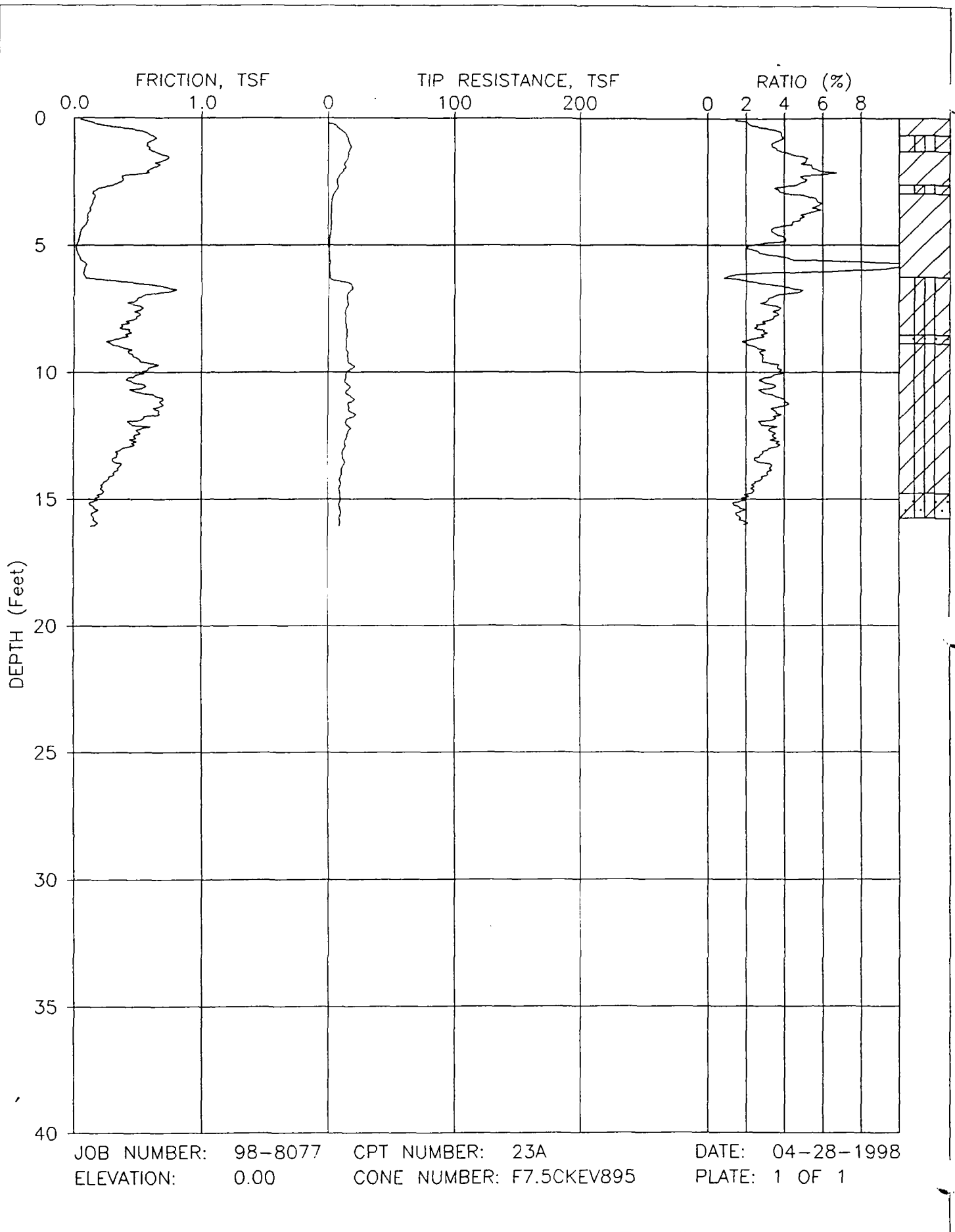


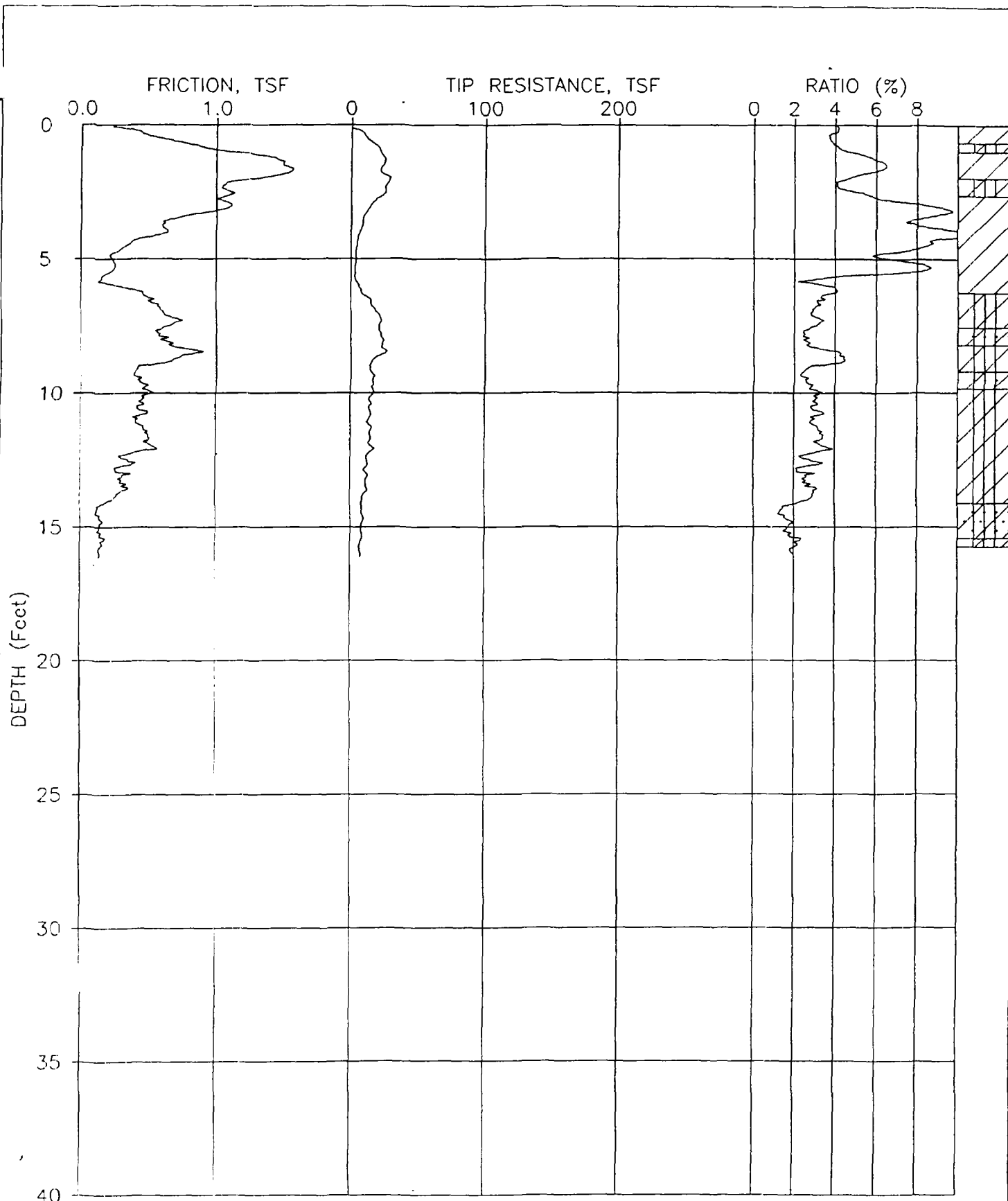
JOB NUMBER: 98-8077
ELEVATION: 0.00

CPT NUMBER: 22
CONE NUMBER: F7.5CKEV895

DATE: 04-28-1998
PLATE: 1 OF 1



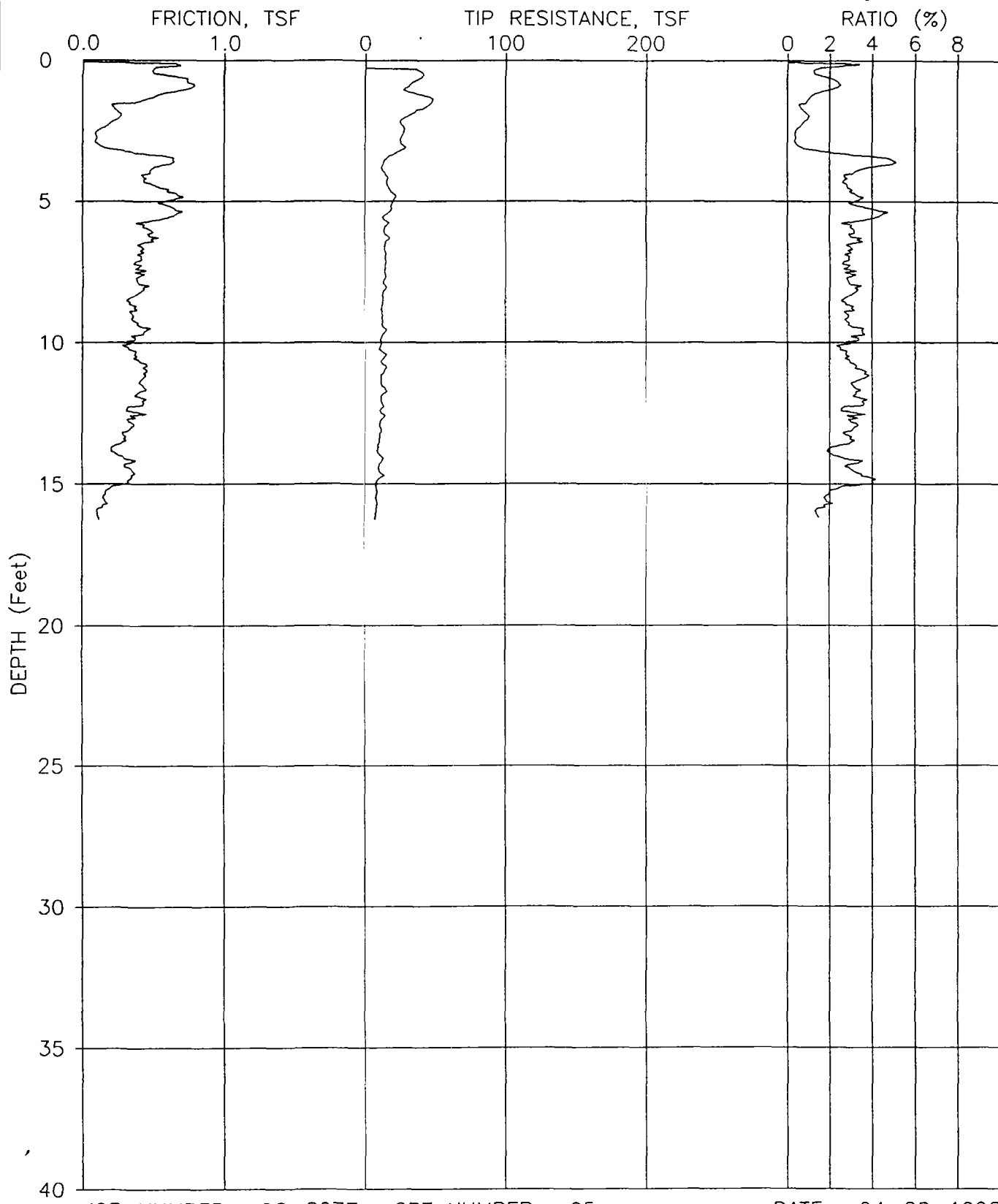




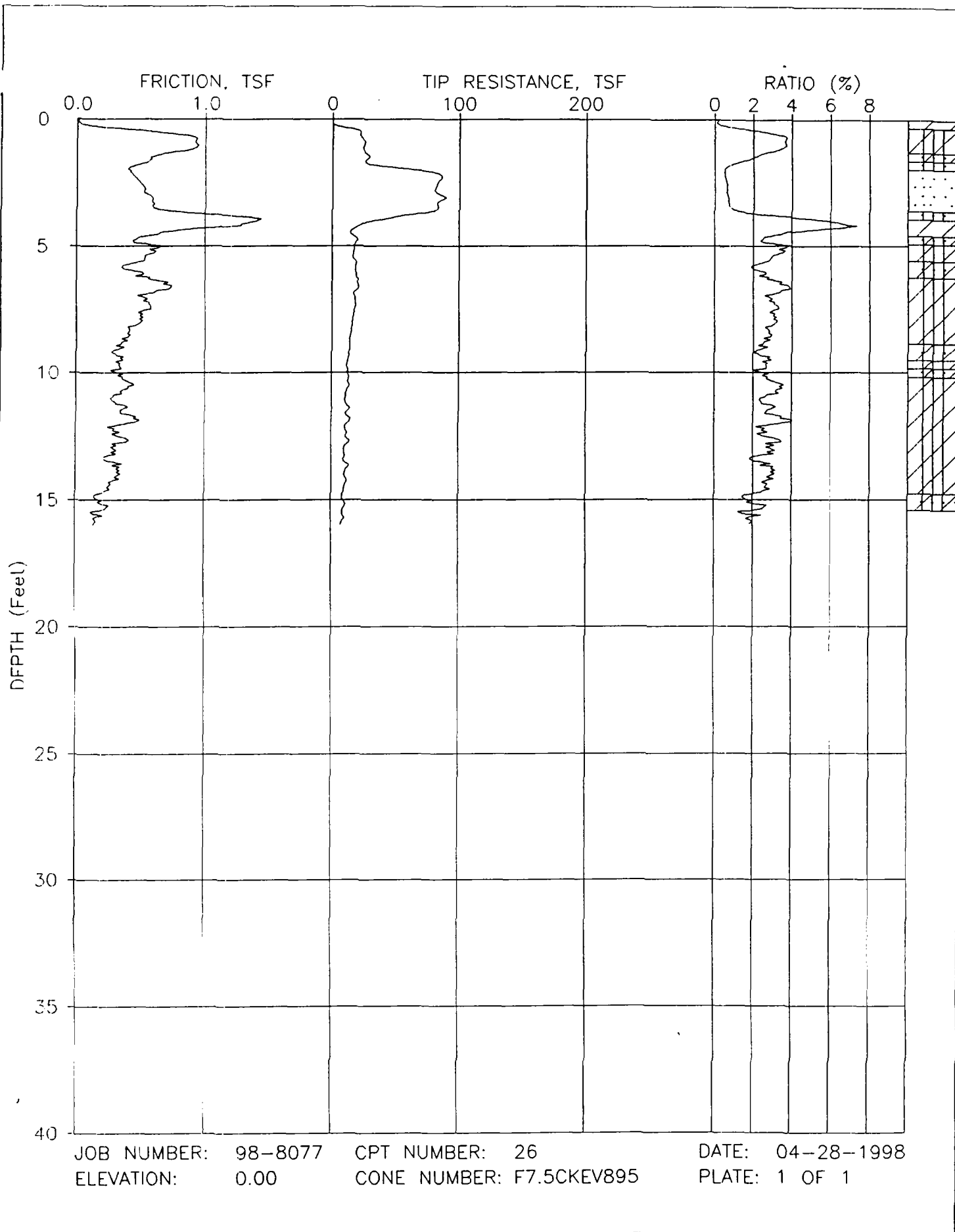
JOB NUMBER: 98-8077
ELEVATION: 0.00

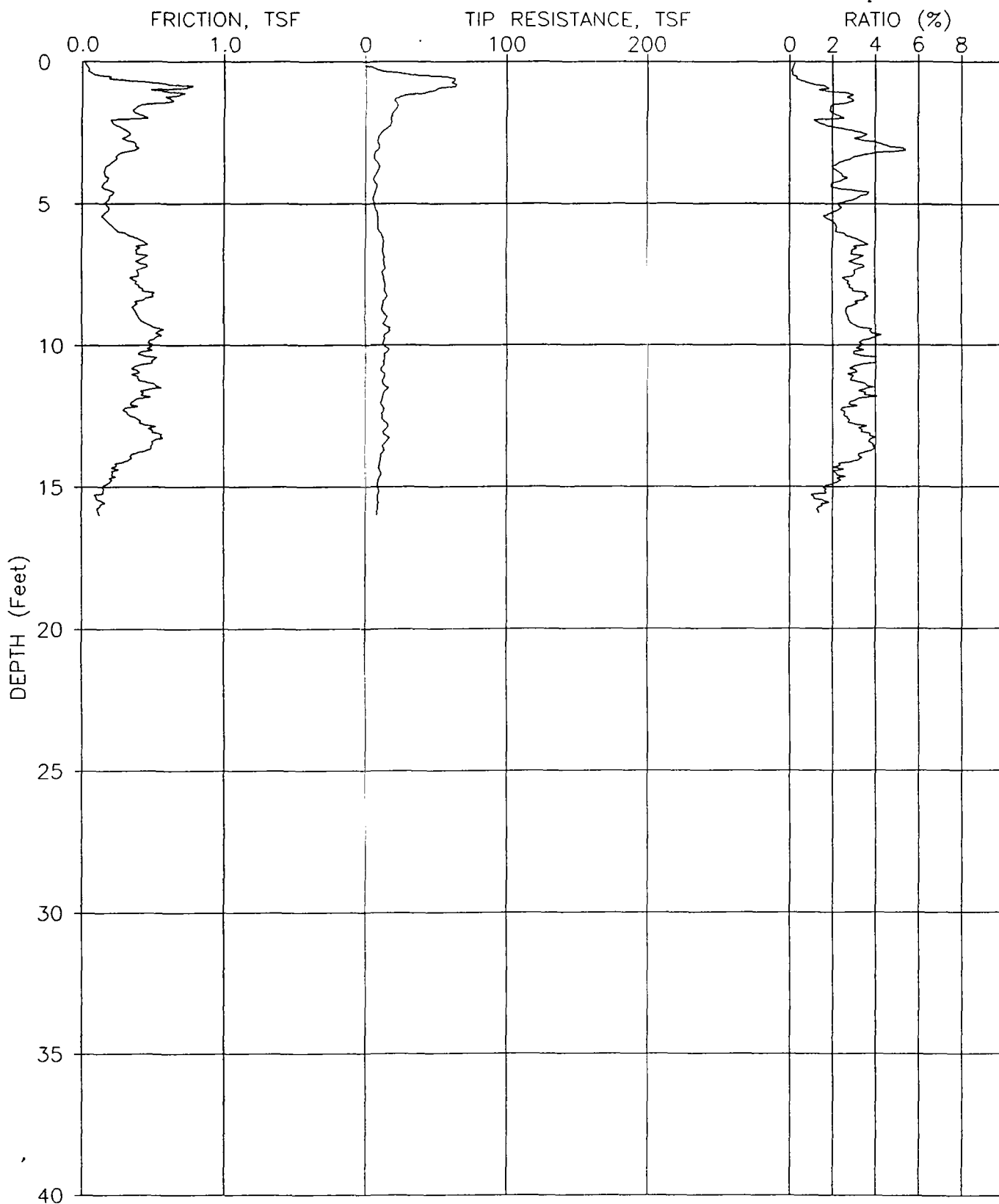
CPT NUMBER: 24
CONE NUMBER: F7.5CKEV895

DATE: 04-28-1998
PLATE: 1 OF 1



JOB NUMBER: 98-8077 CPT NUMBER: 25 DATE: 04-28-1998
ELEVATION: 0.00 CONE NUMBER: F7.5CKEV895 PLATE: 1 OF 1

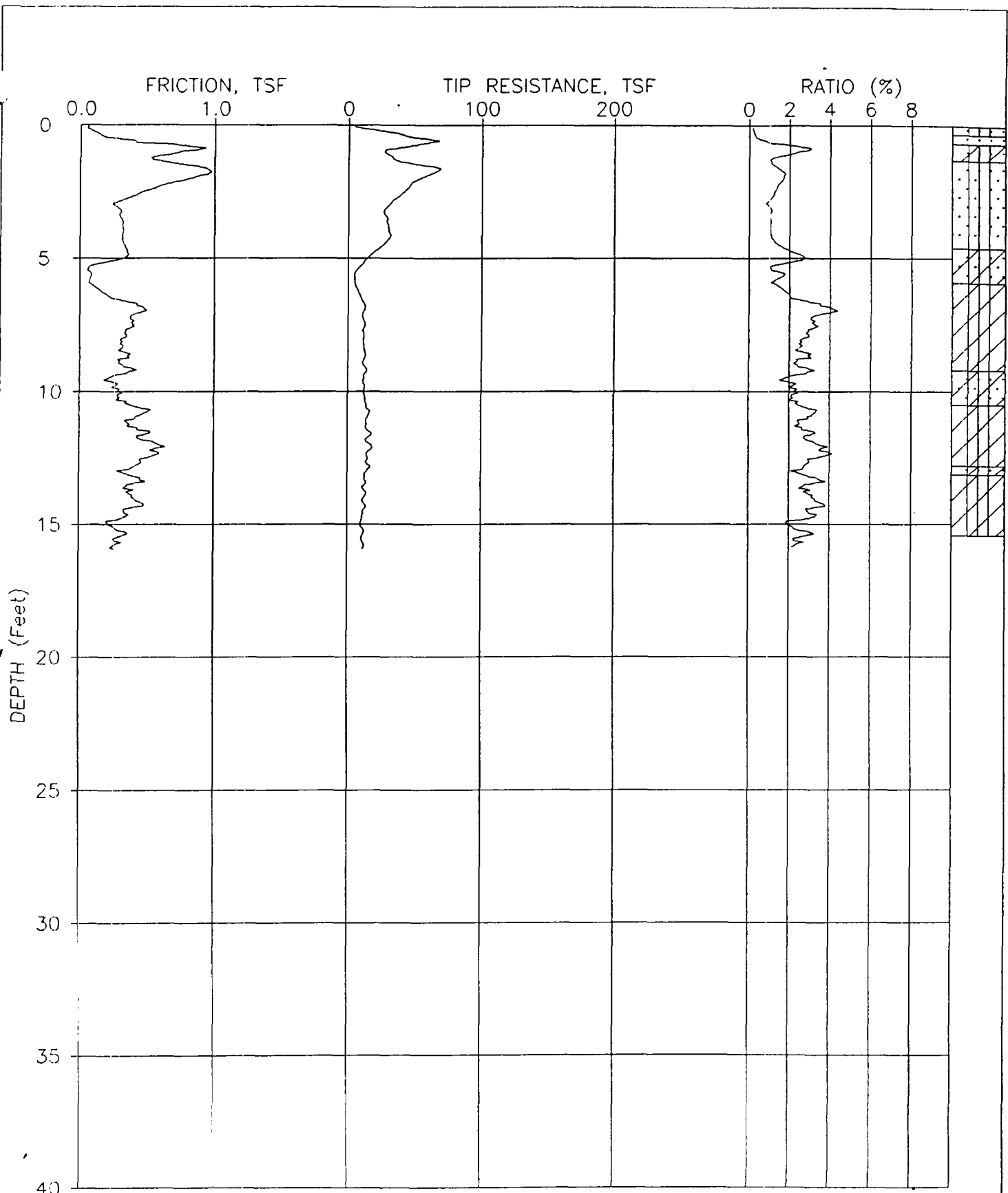




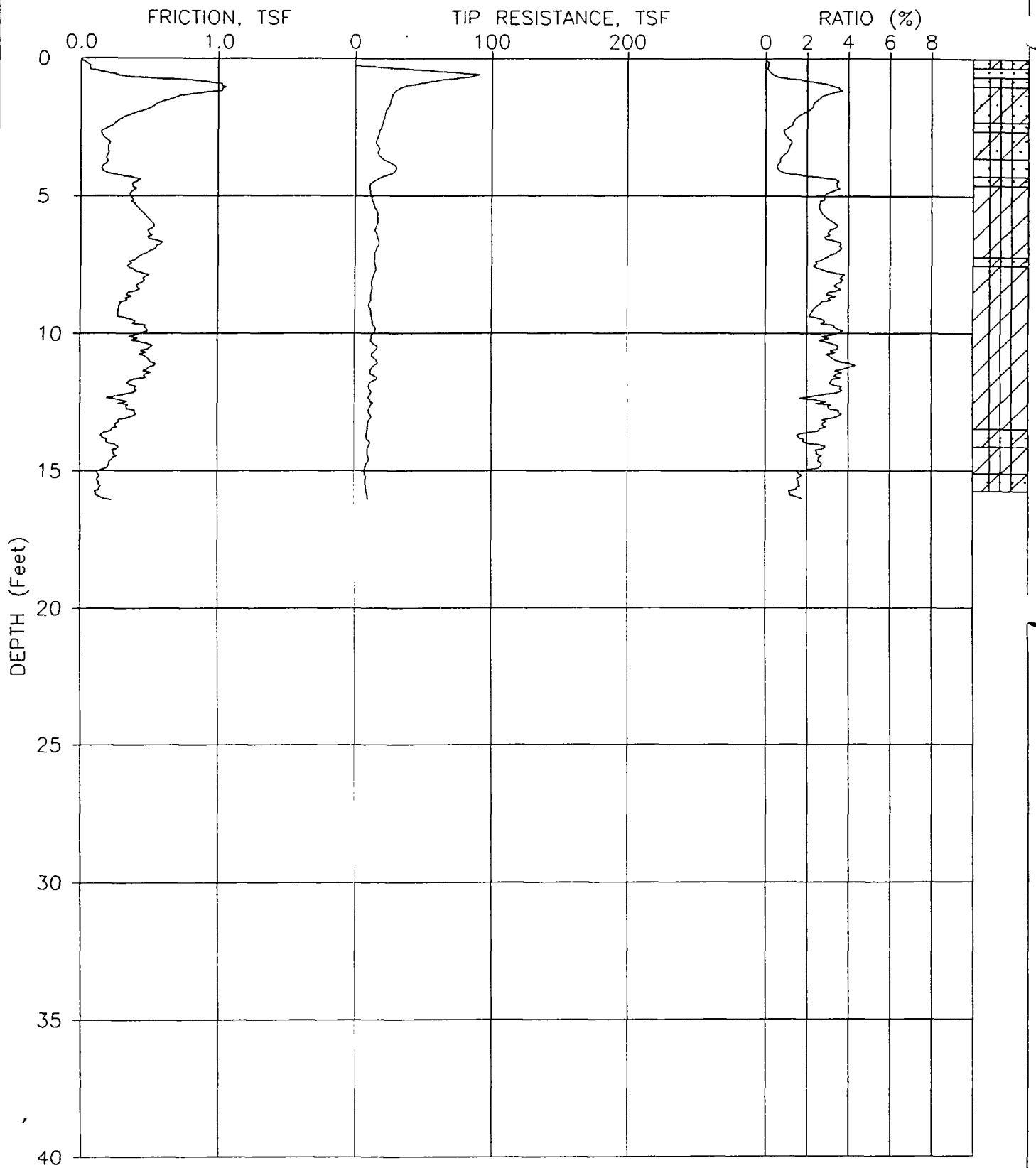
JOB NUMBER: 98-8077
ELEVATION: 0.00

CPT NUMBER: 27
CONE NUMBER: F7.5CKEV895

DATE: 04-28-1998
PLATE: 1 OF 1



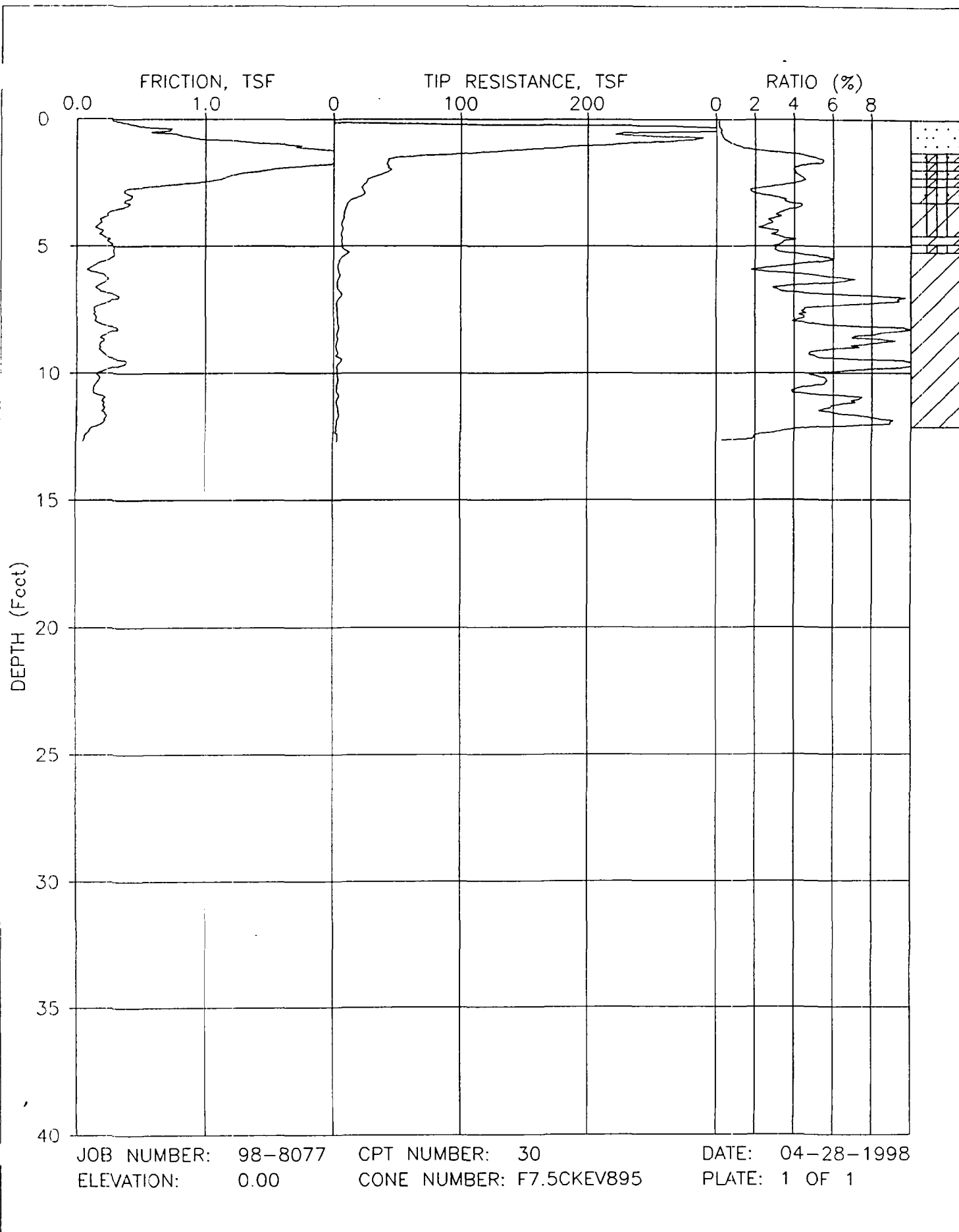
JOB NUMBER: 98-8077 CPT NUMBER: 28 DATE: 04-28-1998
ELEVATION: 0.00 CONE NUMBER: F7.5CKEV895 PLATE: 1 OF 1

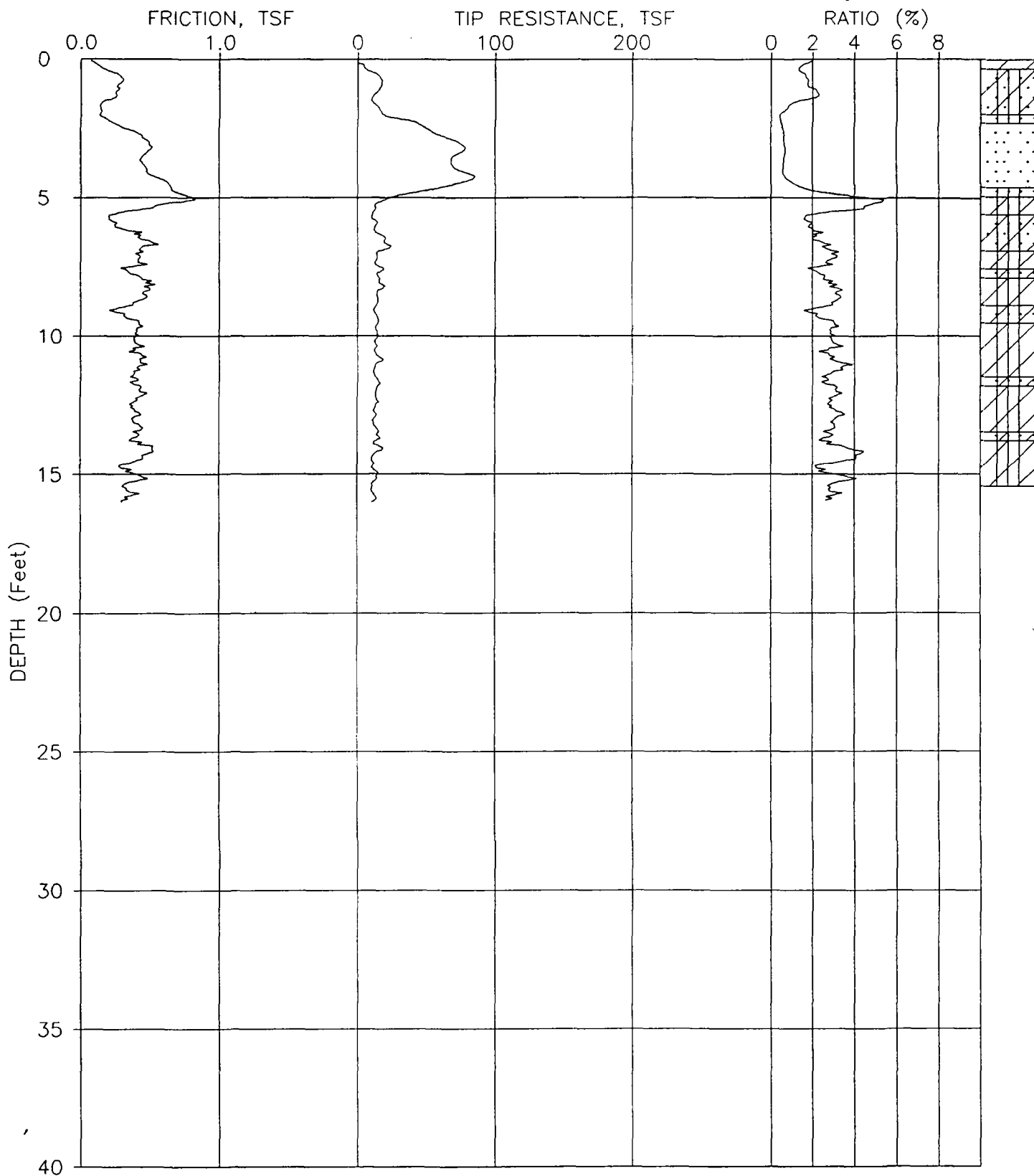


JOB NUMBER: 98-8077
ELEVATION: 0.00

CPT NUMBER: 29
CONE NUMBER: F7.5CKEV895

DATE: 04-28-1998
PLATE: 1 OF 1

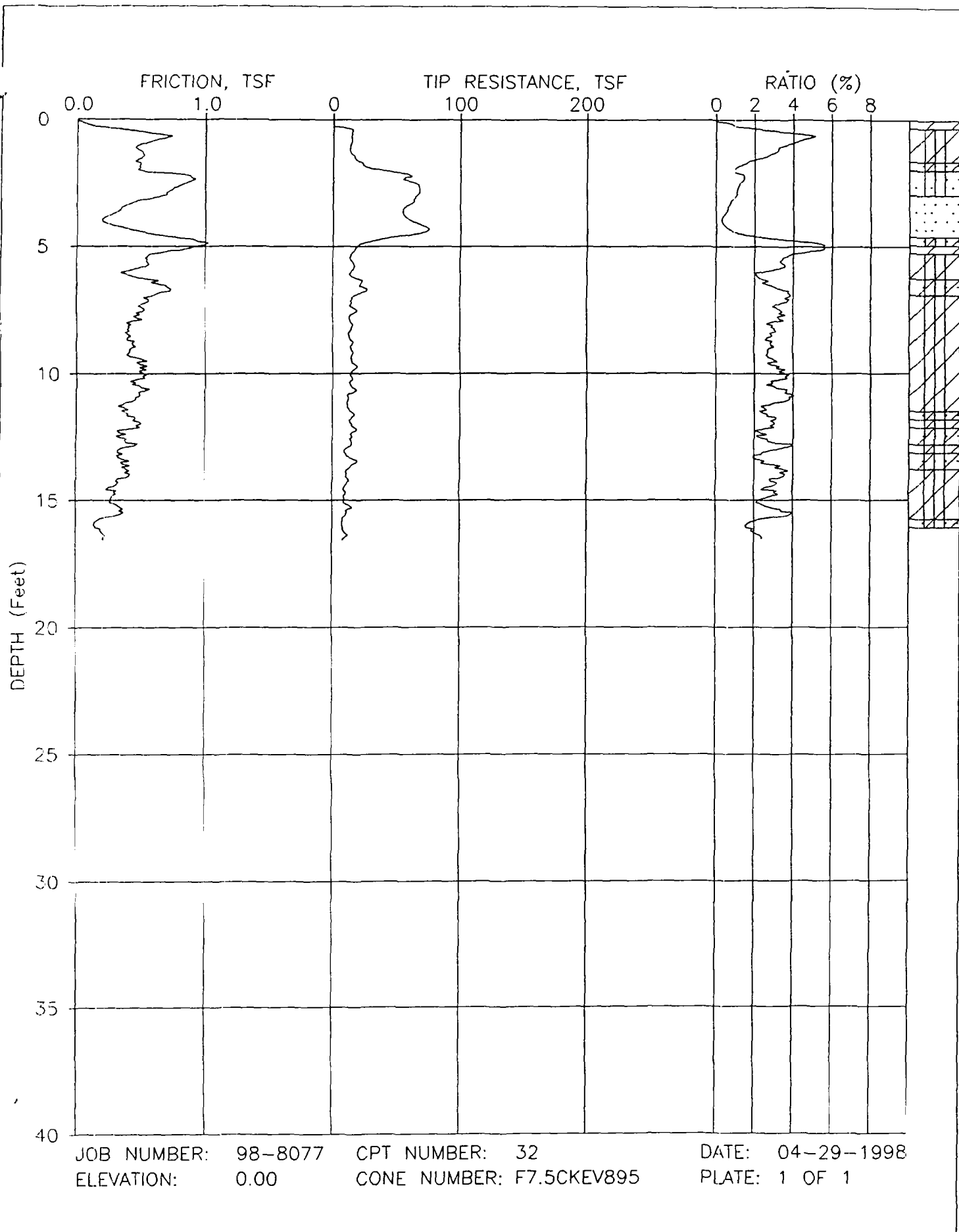


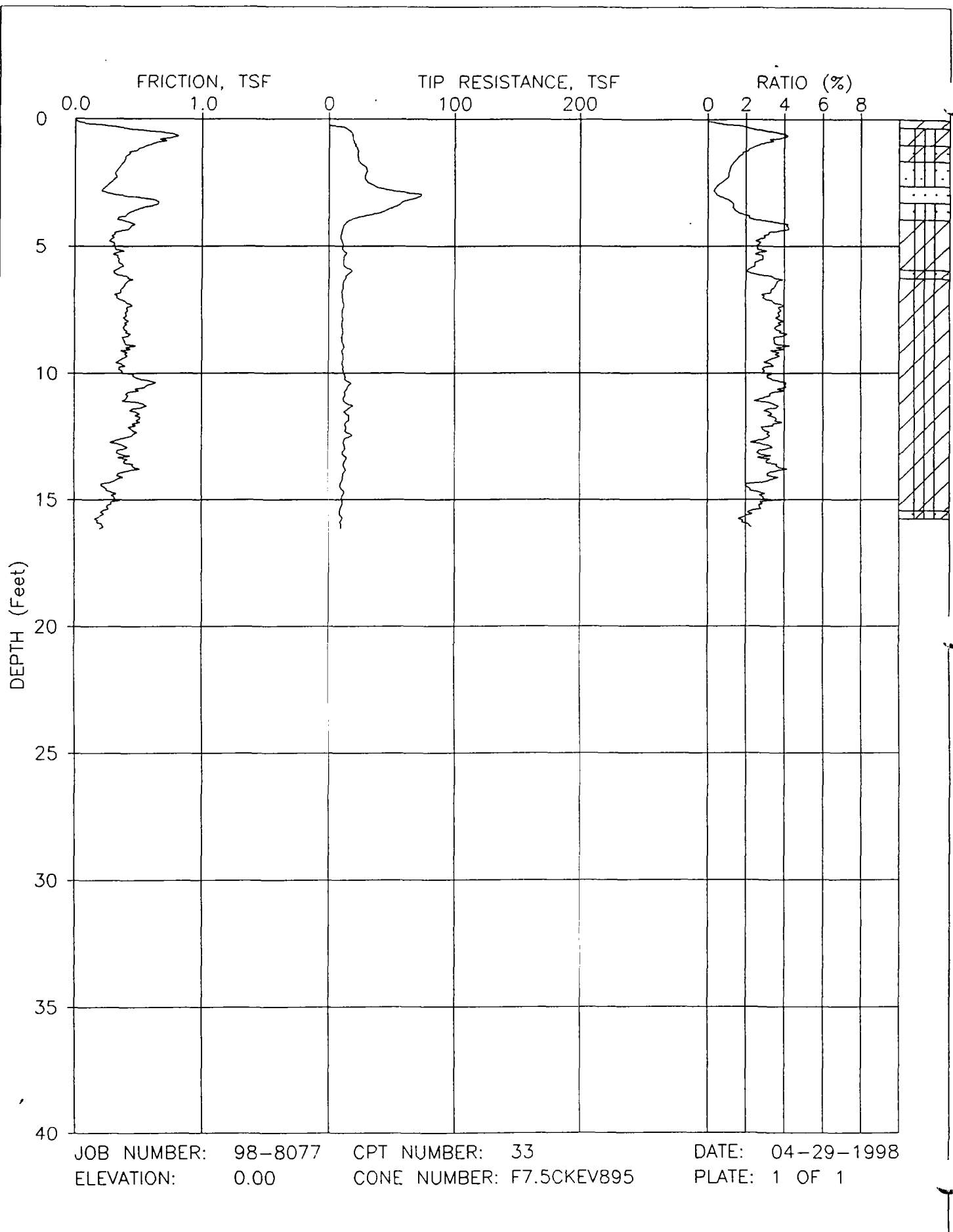


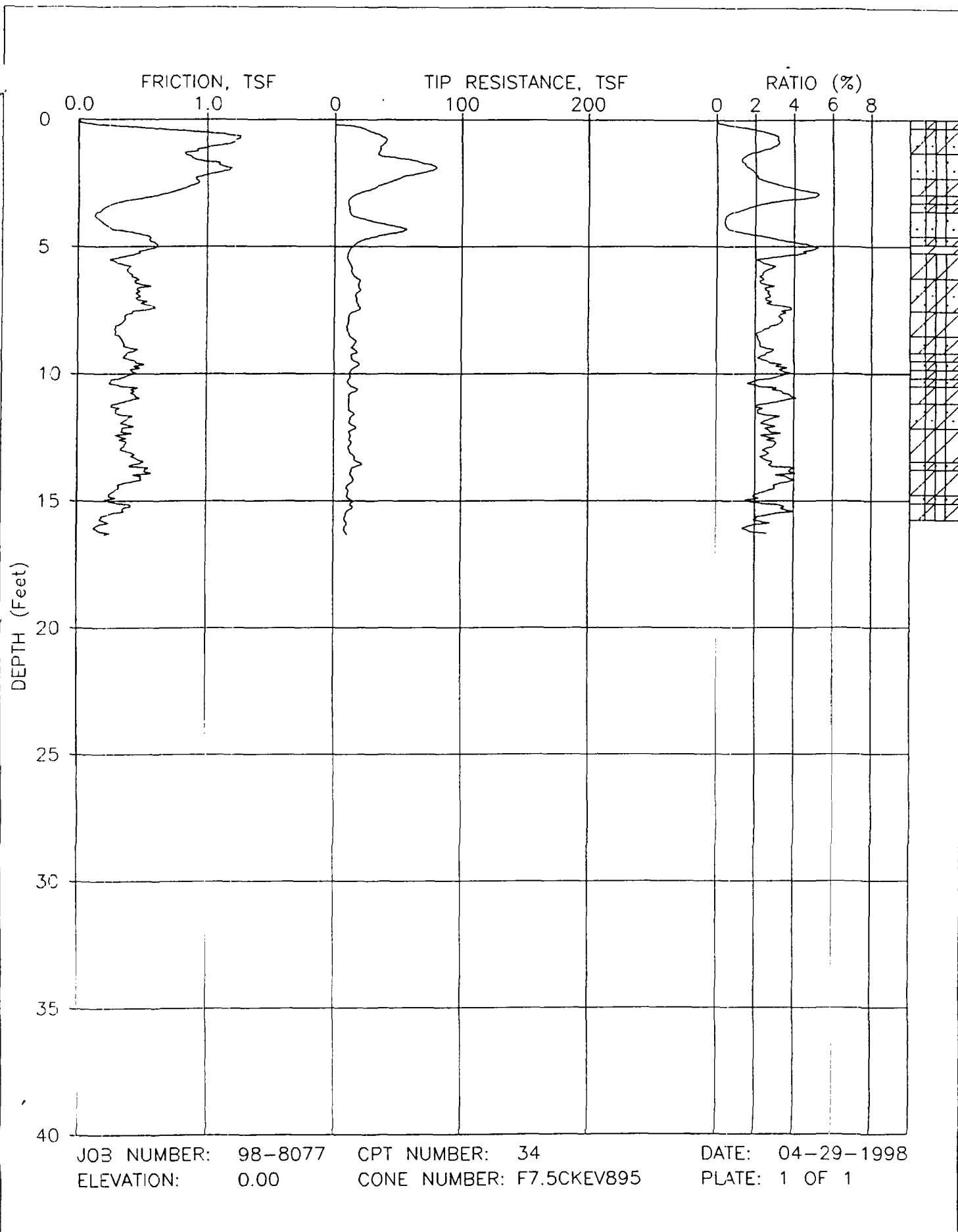
JOB NUMBER: 98-8077
ELEVATION: 0.00

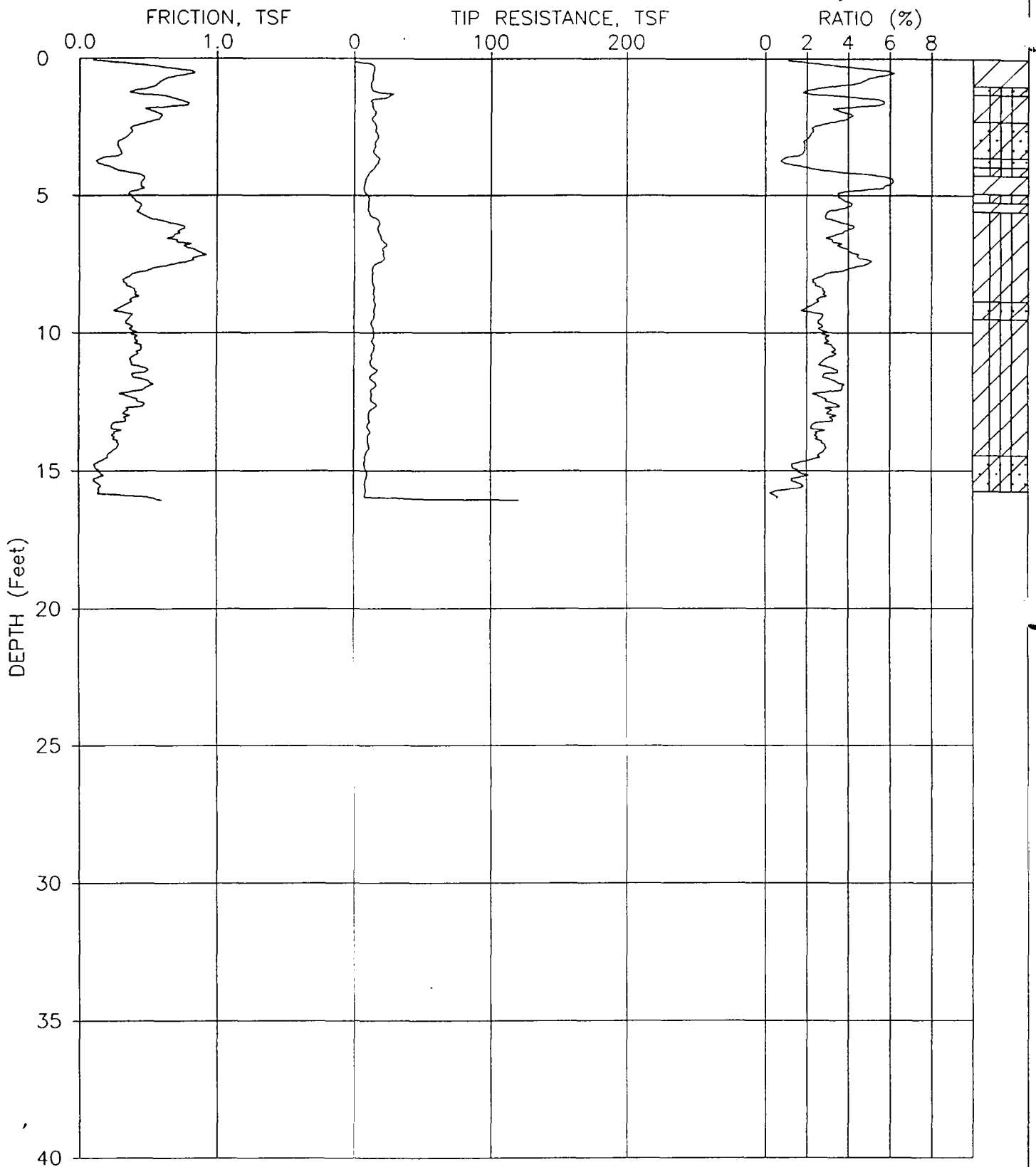
CPT NUMBER: 31
CONE NUMBER: F7.5CKEV895

DATE: 04-28-1998
PLATE: 1 OF 1









JOB NUMBER: 98-8077

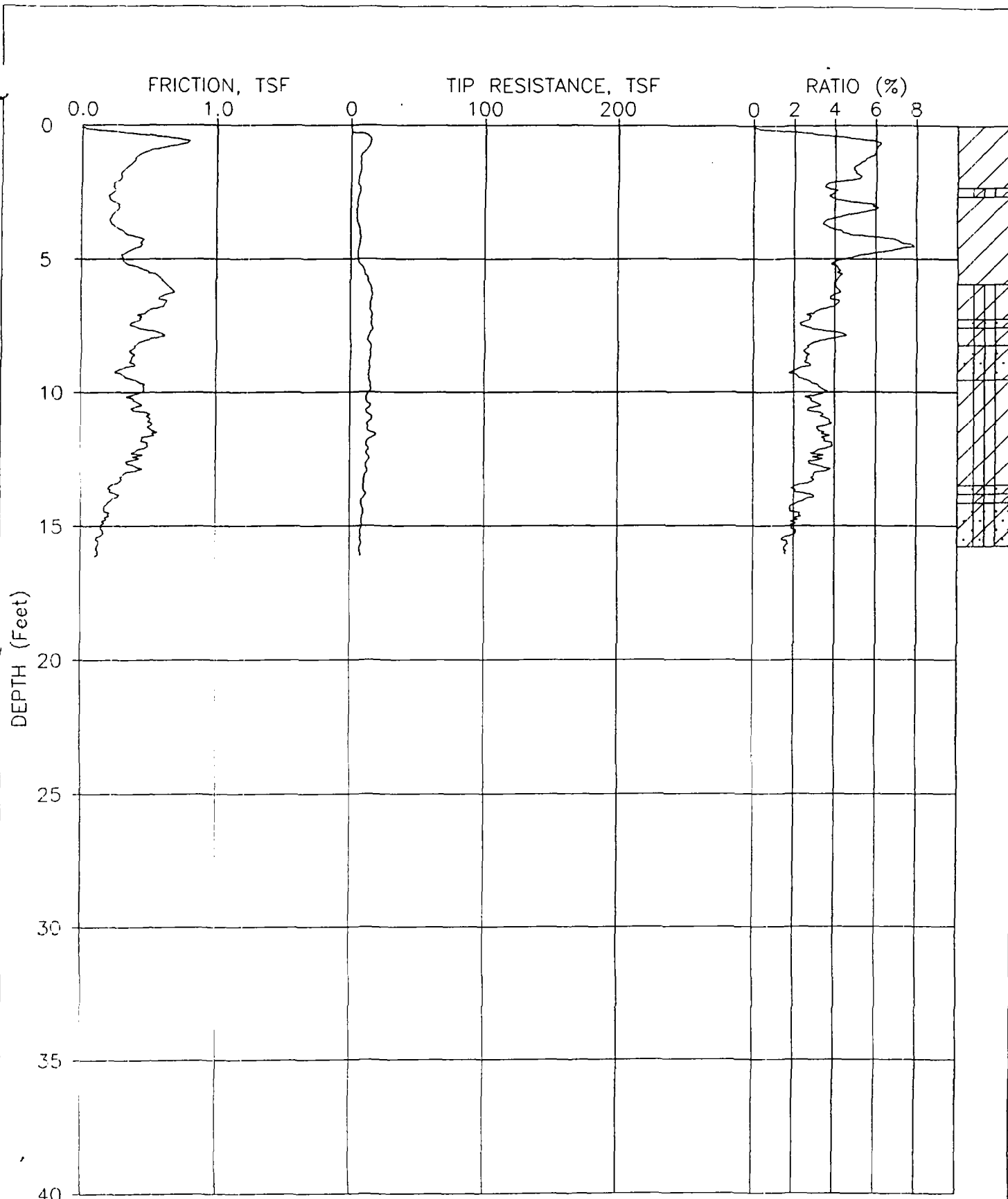
CPT NUMBER: 35

DATE: 04-29-1998

ELEVATION: 0.00

CONE NUMBER: F7.5CKEV895

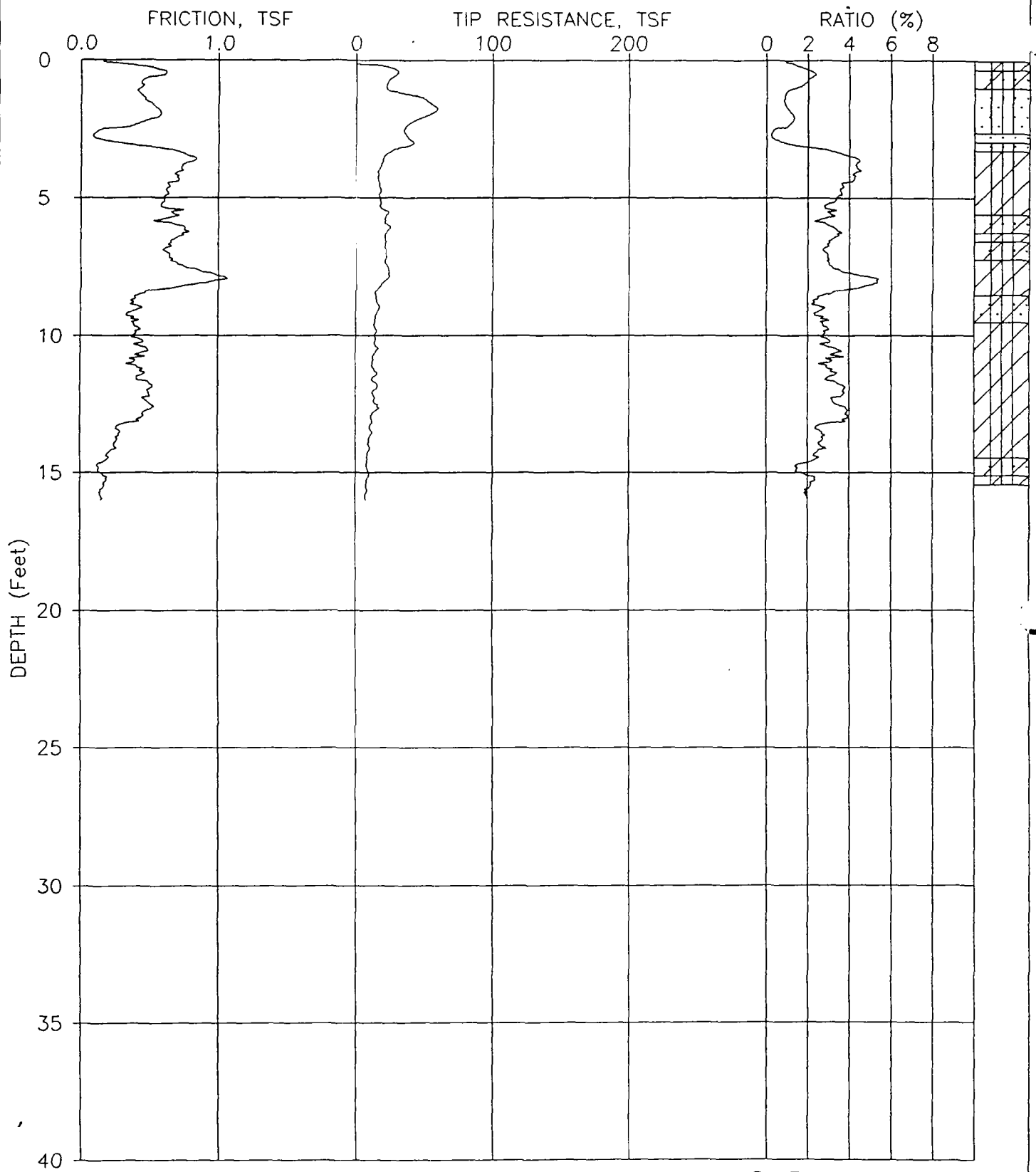
PLATE: 1 OF 1



JOB NUMBER: 98-8077
ELEVATION: 0.00

CPT NUMBER: 36
CONE NUMBER: F7.5CKEV895

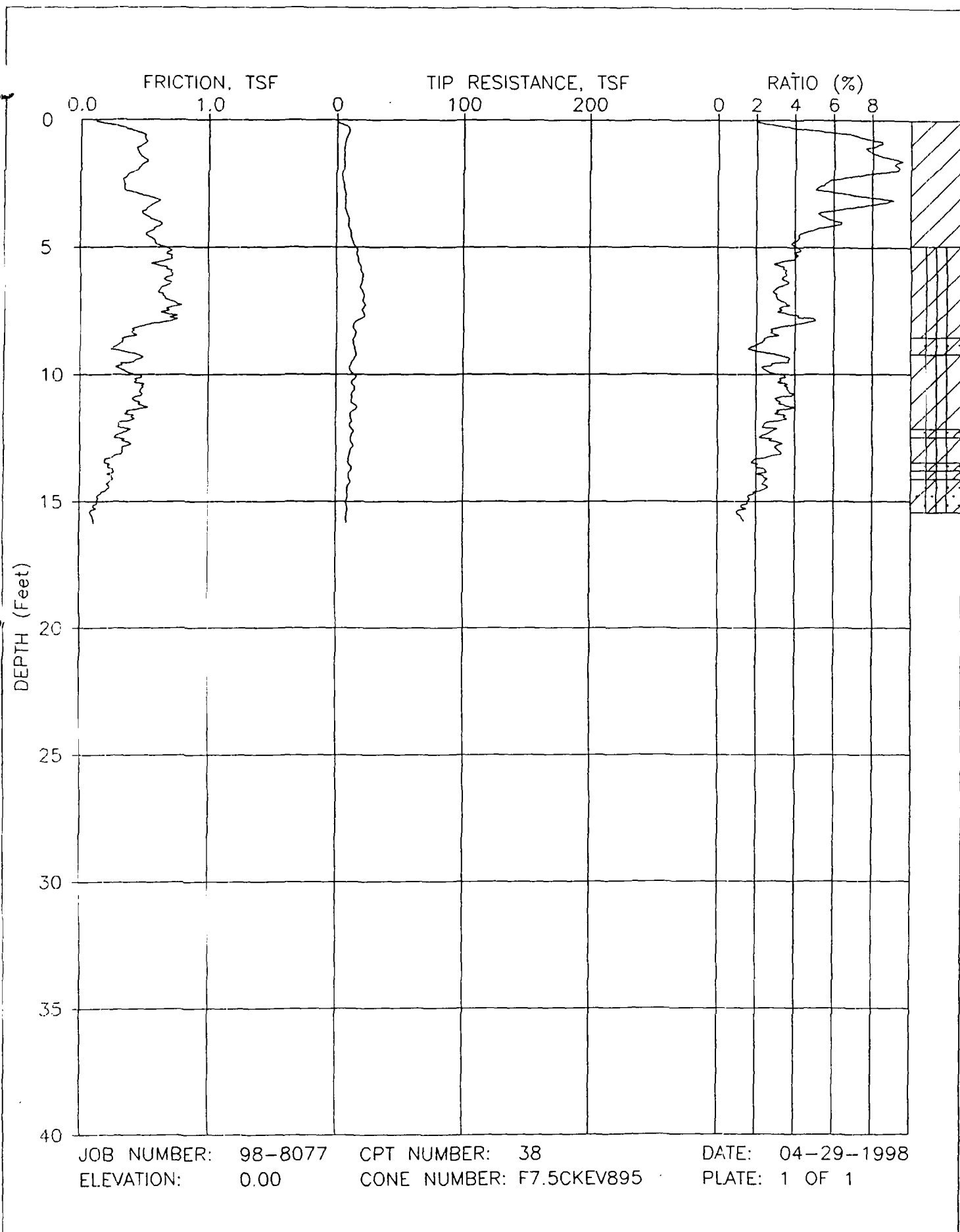
DATE: 04-29-1998
PLATE: 1 OF 1

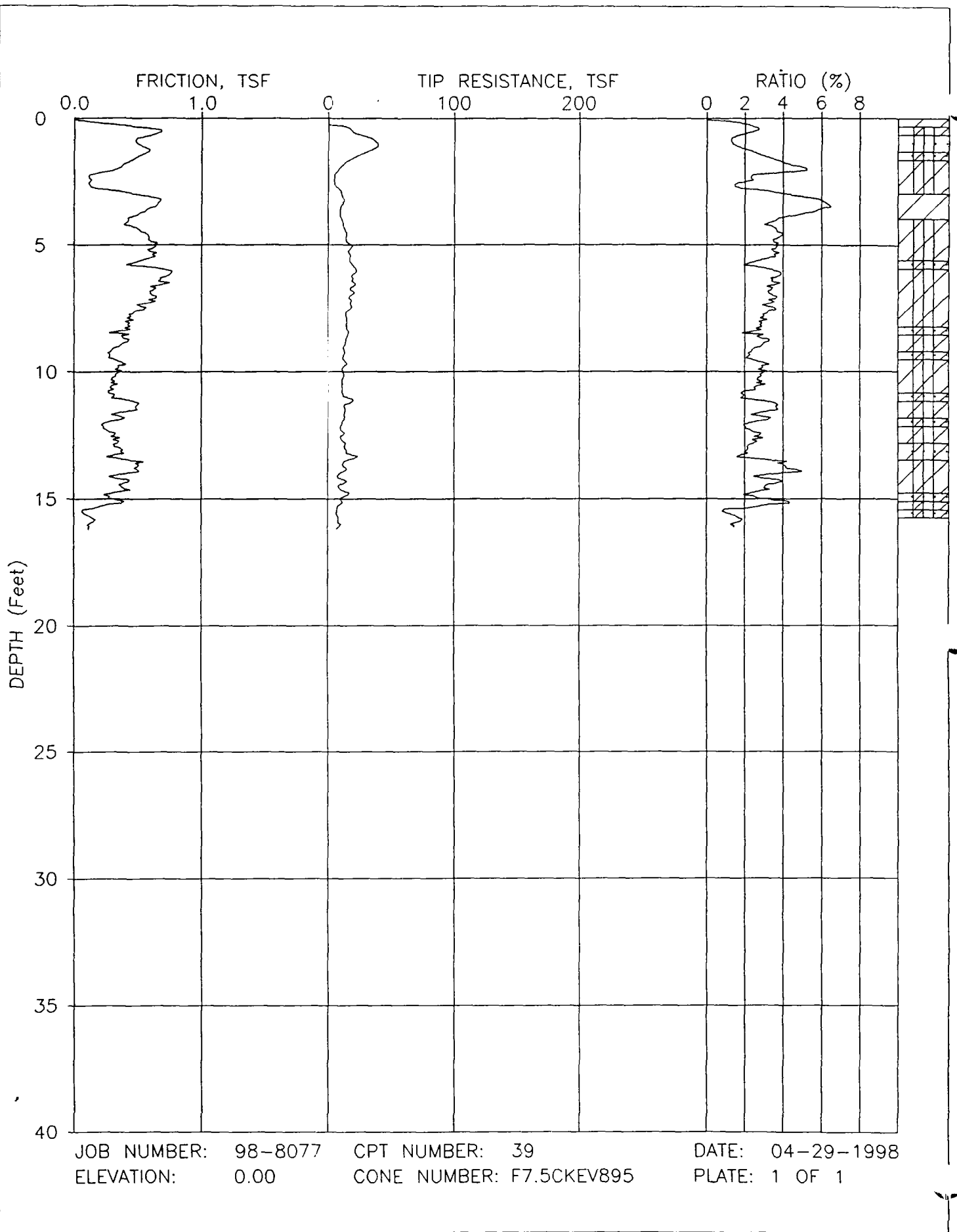


JOB NUMBER: 98-8077
ELEVATION: 0.00

CPT NUMBER: 37
CONE NUMBER: F7.5CKEV895

DATE: 04-29-1998
PLATE: 1 OF 1

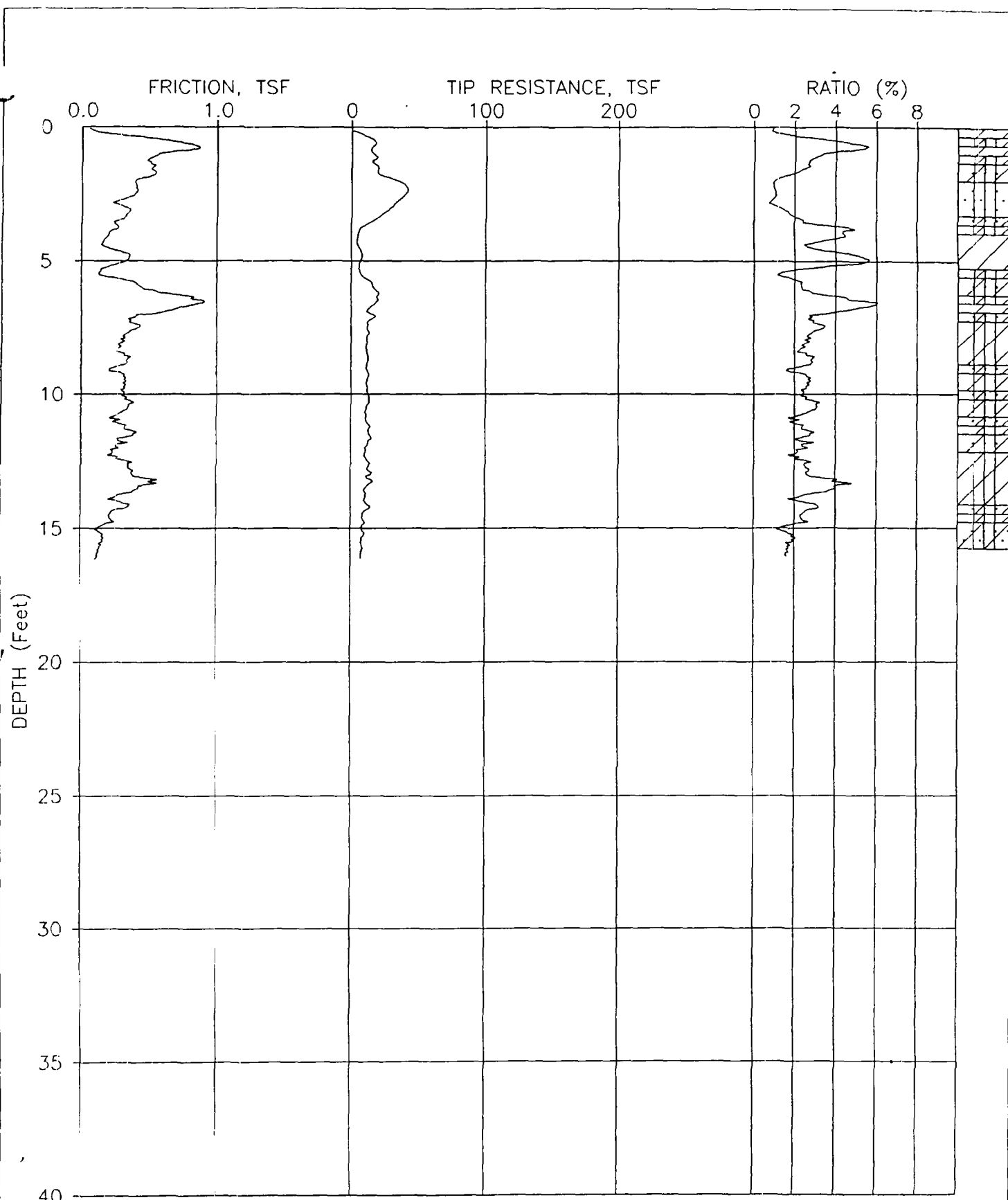




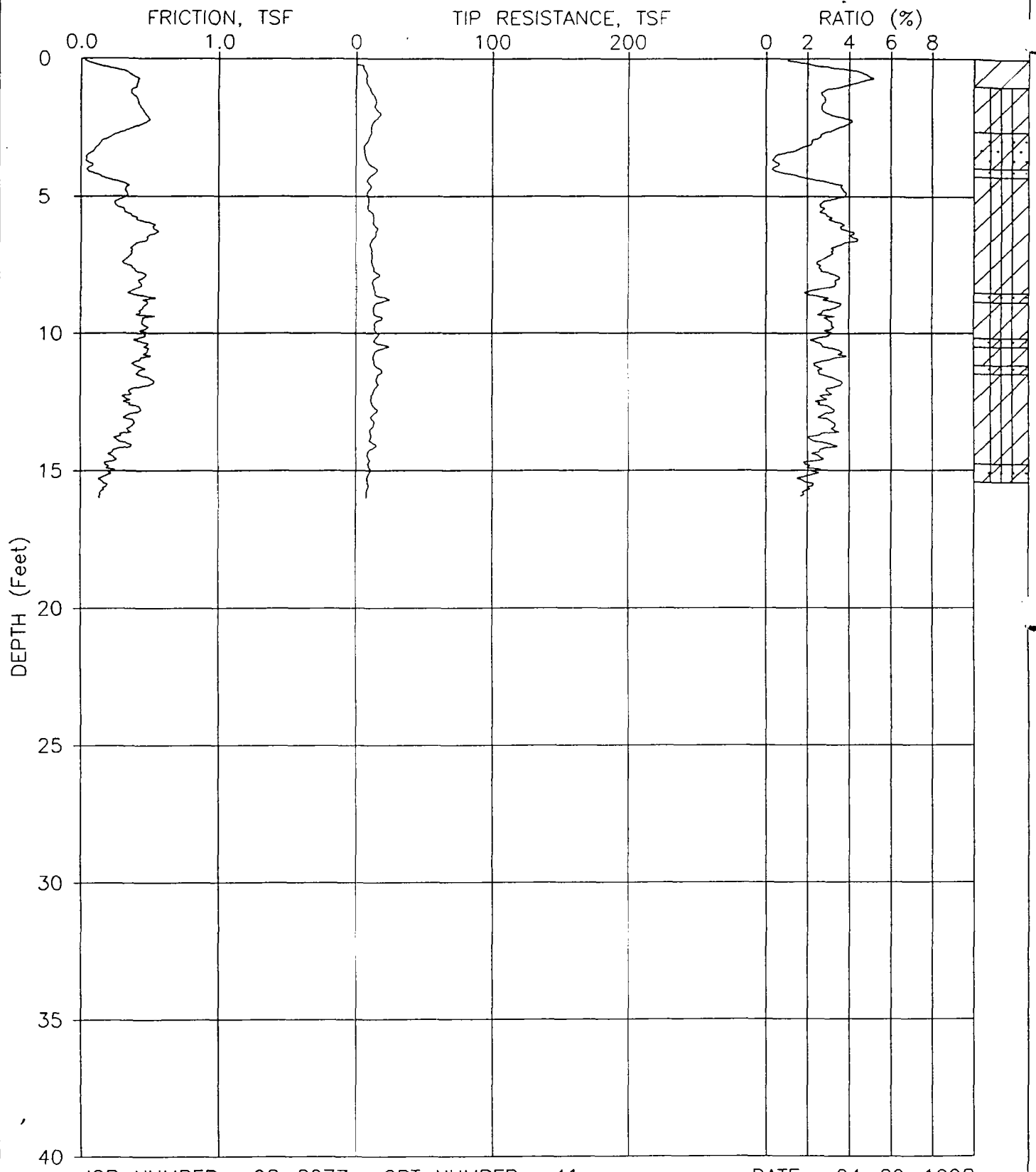
JOB NUMBER: 98-8077
ELEVATION: 0.00

CPT NUMBER: 39
CONE NUMBER: F7.5CKEV895

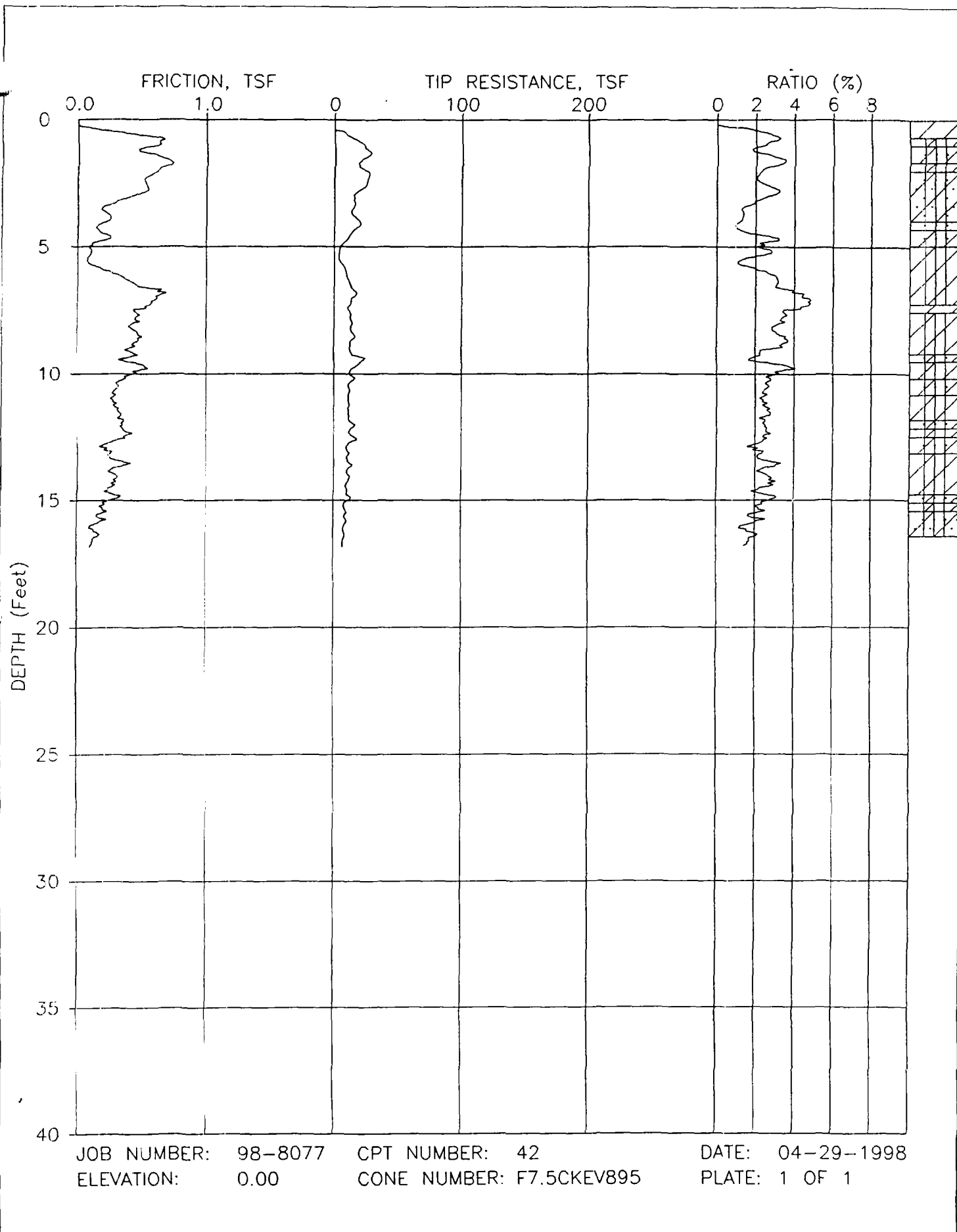
DATE: 04-29-1998
PLATE: 1 OF 1



JOB NUMBER: 98-8077 CPT NUMBER: 40 DATE: 04-29-1998
ELEVATION: 0.00 CONE NUMBER: F7.5CKEV895 PLATE: 1 OF 1



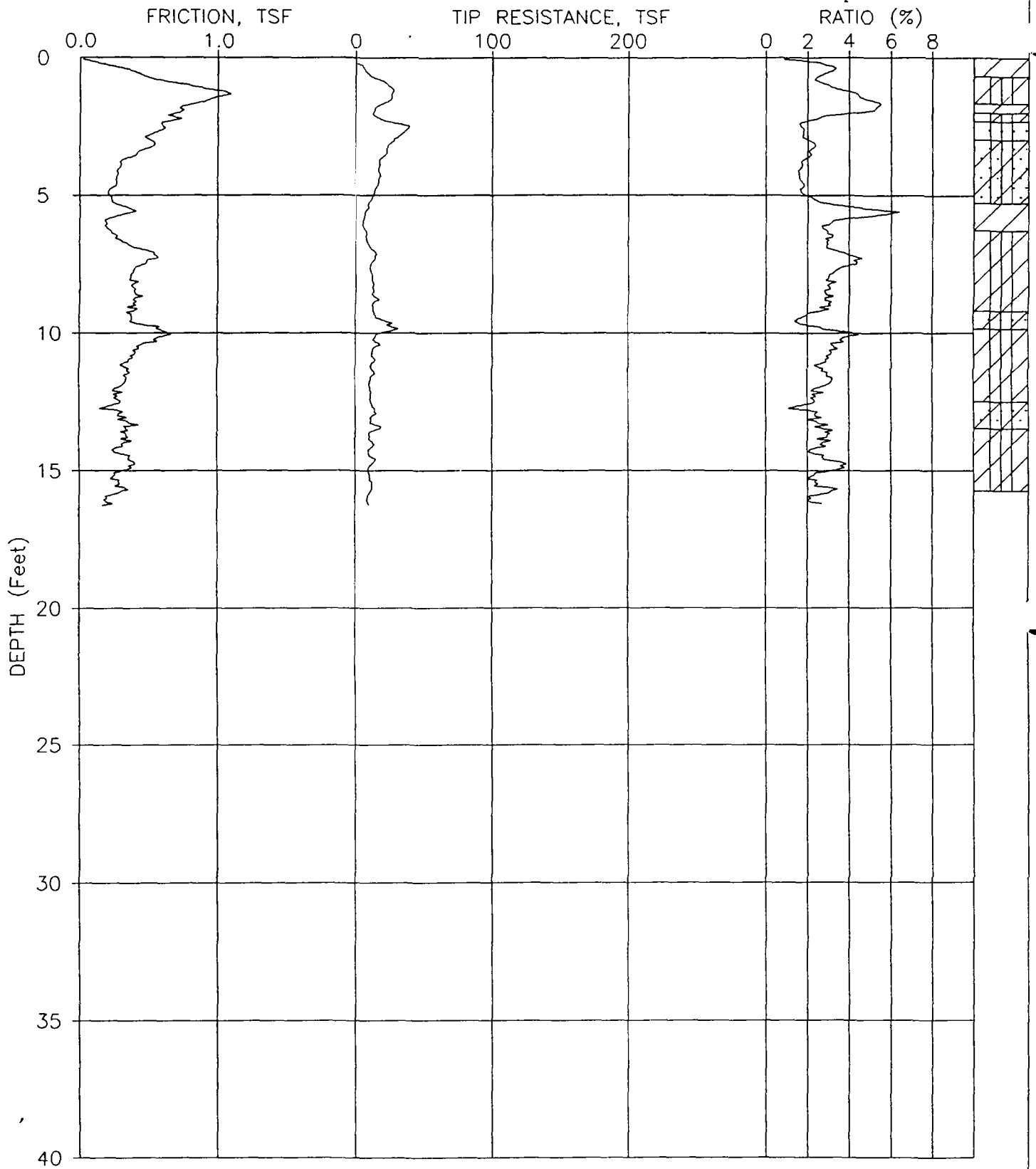
JOB NUMBER: 98-8077 CPT NUMBER: 41 DATE: 04-29-1998
ELEVATION: 0.00 CONE NUMBER: F7.5CKEV895 PLATE: 1 OF 1



JOB NUMBER: 98-8077
ELEVATION: 0.00

CPT NUMBER: 42
CONE NUMBER: F7.5CKEV895

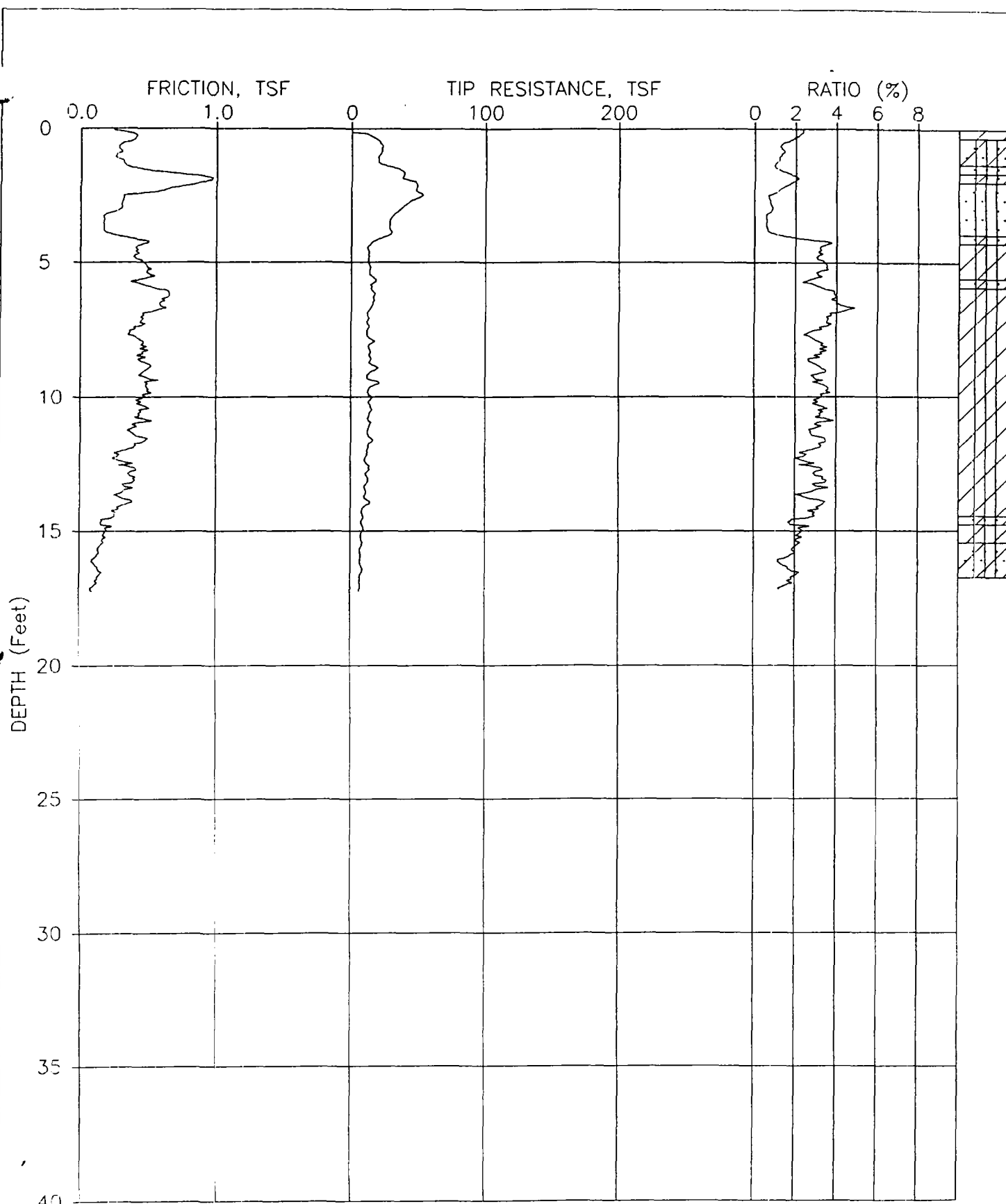
DATE: 04-29-1998
PLATE: 1 OF 1



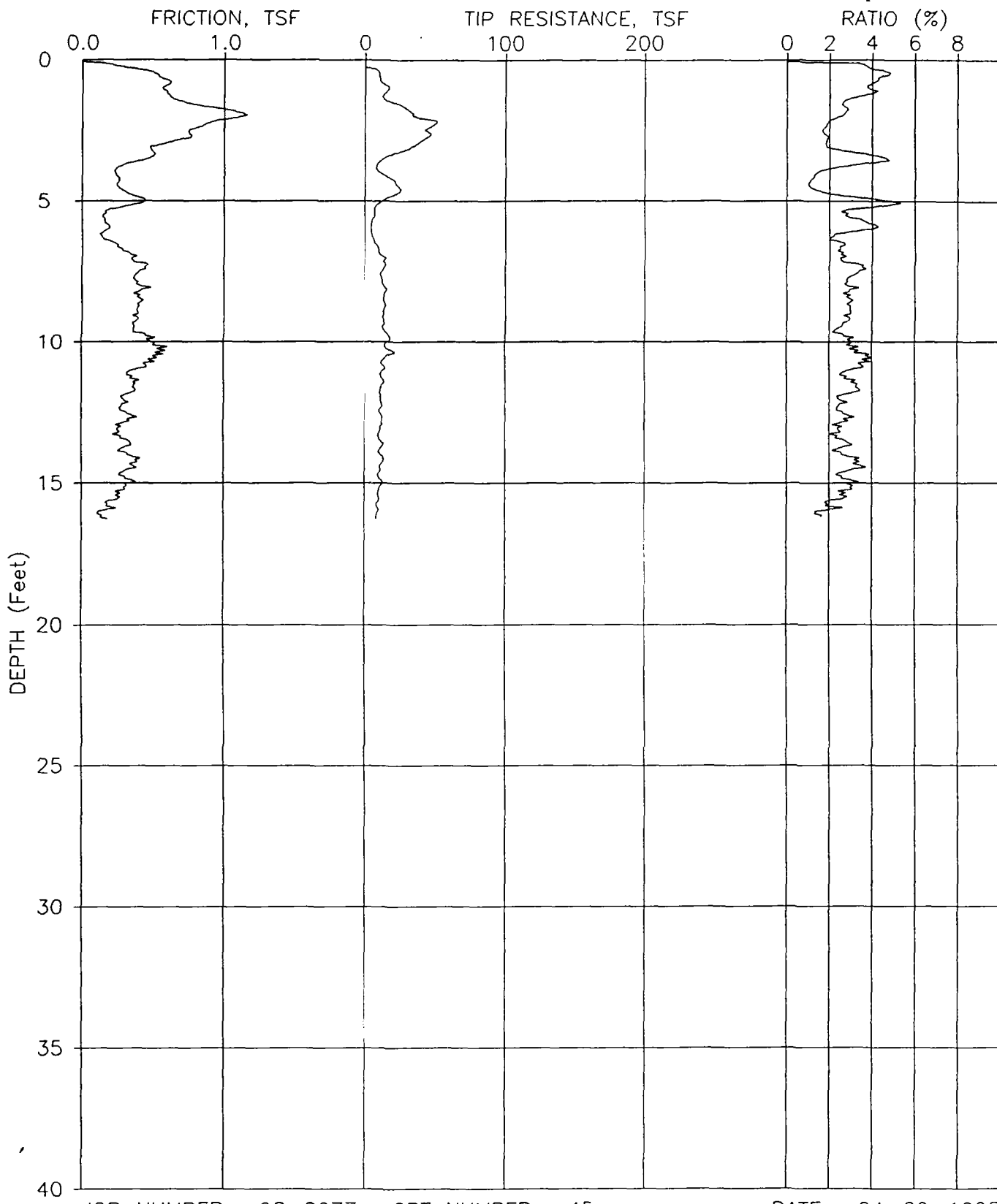
JOB NUMBER: 98-8077
ELEVATION: 0.00

CPT NUMBER: 43
CONE NUMBER: F7.5CKEV895

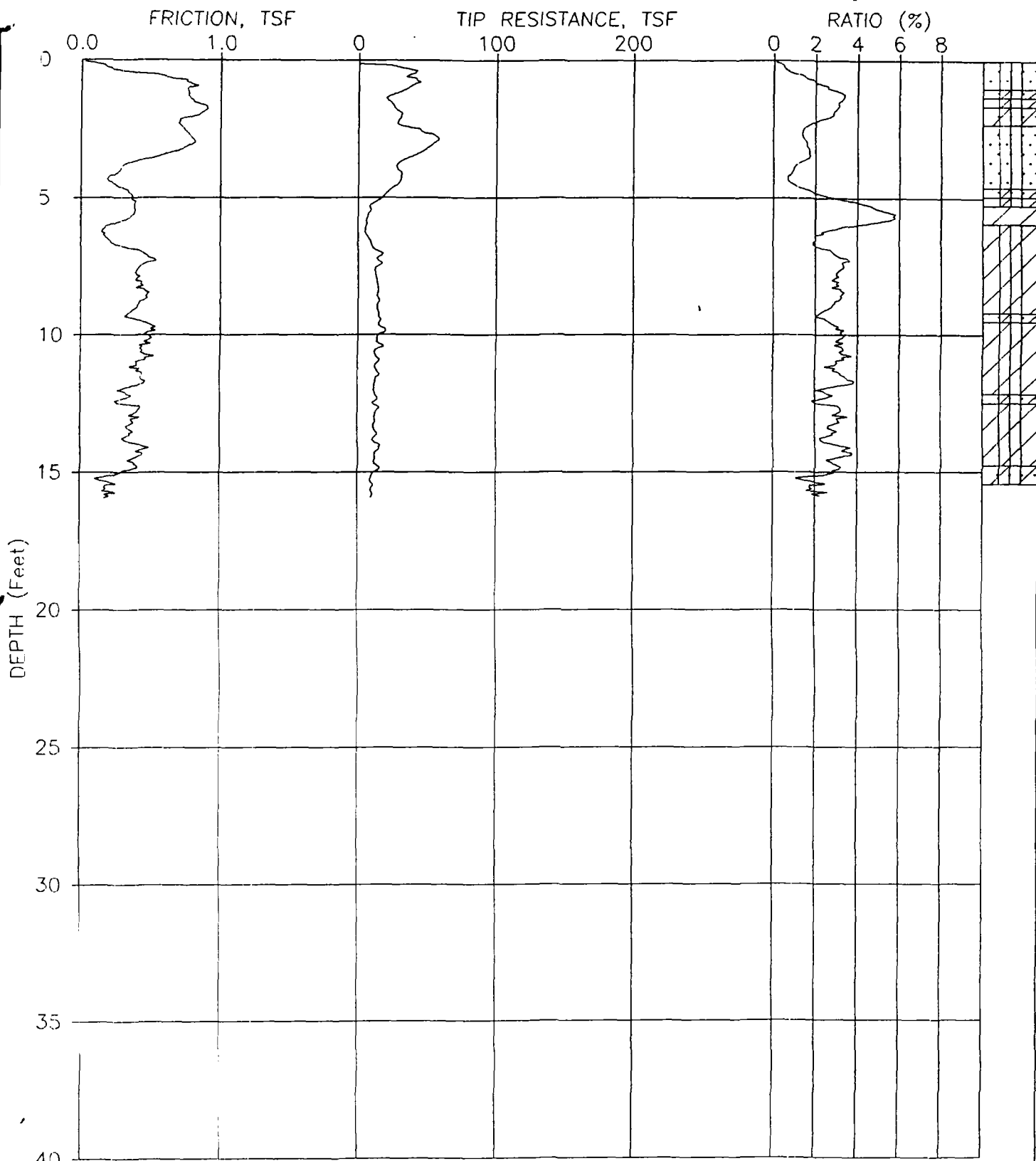
DATE: 04-29-1998
PLATE: 1 OF 1



JOB NUMBER: 98-8077 CPT NUMBER: 44 DATE: 04-29-1998
ELEVATION: 0.00 CONE NUMBER: F7.5CKEV895 PLATE: 1 OF 1



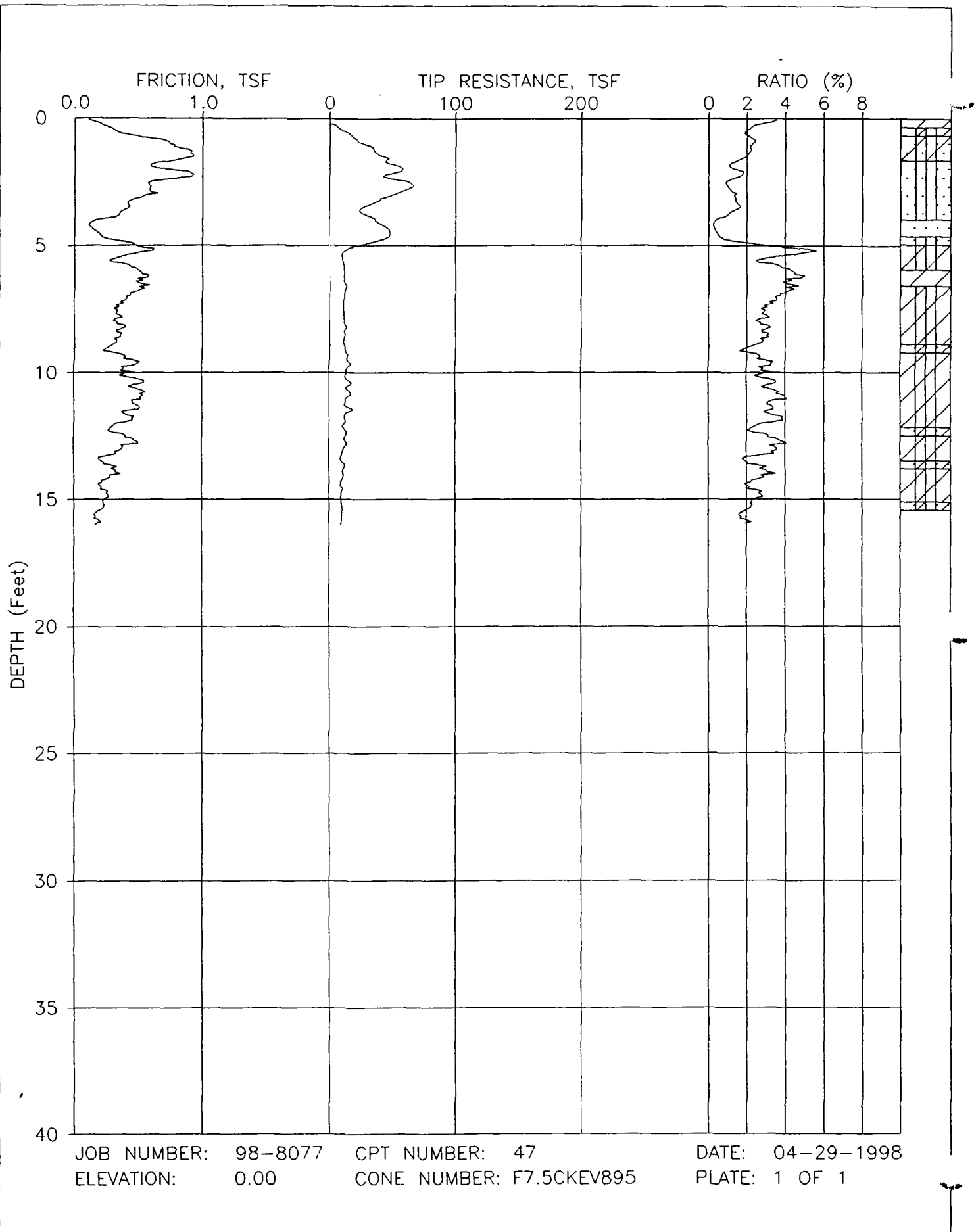
JOB NUMBER: 98-8077 CPT NUMBER: 45 DATE: 04-29-1998
ELEVATION: 0.00 CONE NUMBER: F7.5CKEV895 PLATE: 1 OF 1

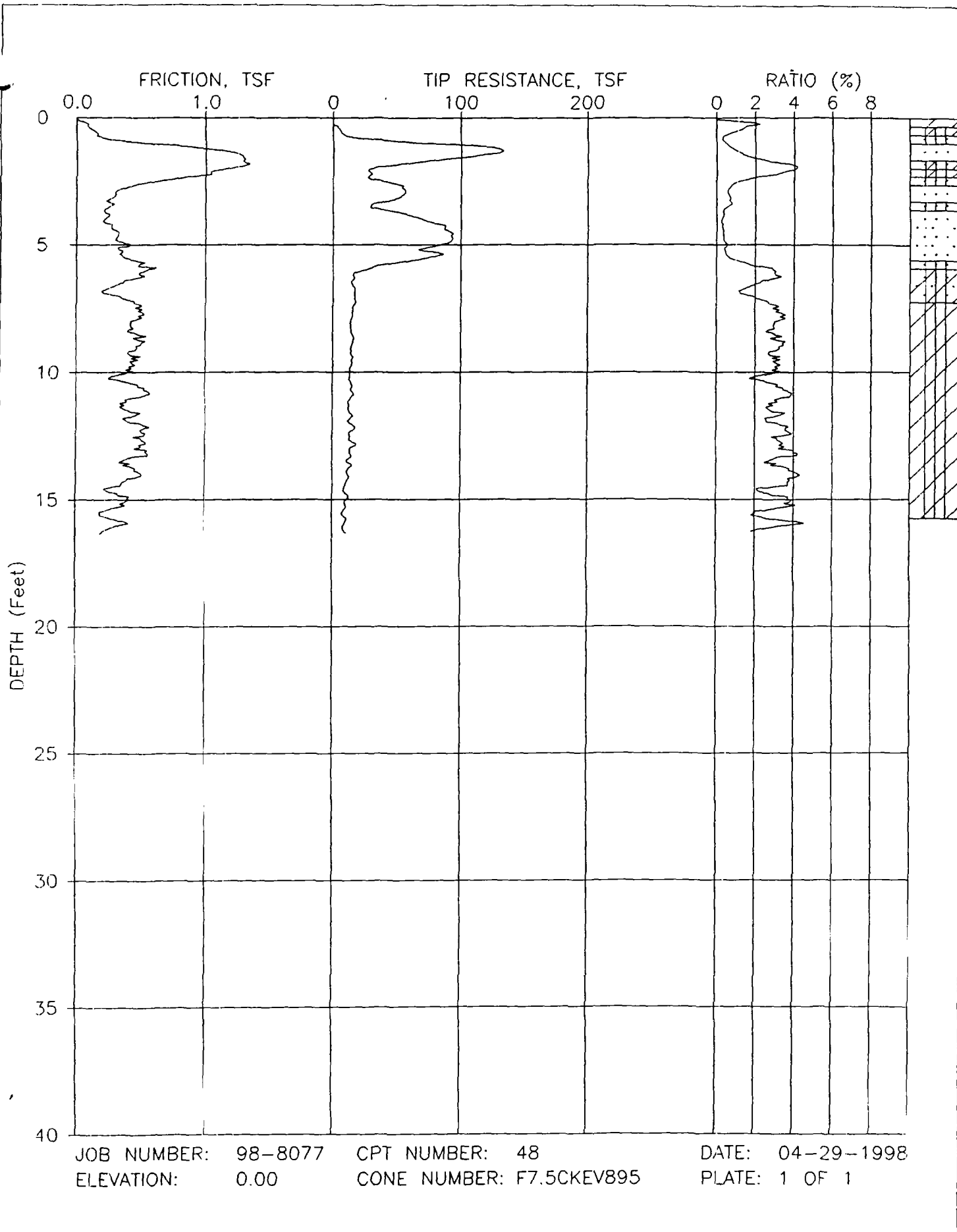


JOB NUMBER: 98-8077
ELEVATION: 0.00

CPT NUMBER: 46
CONE NUMBER: F7.5CKEV895

DATE: 04-29-1998
PLATE: 1 OF 1

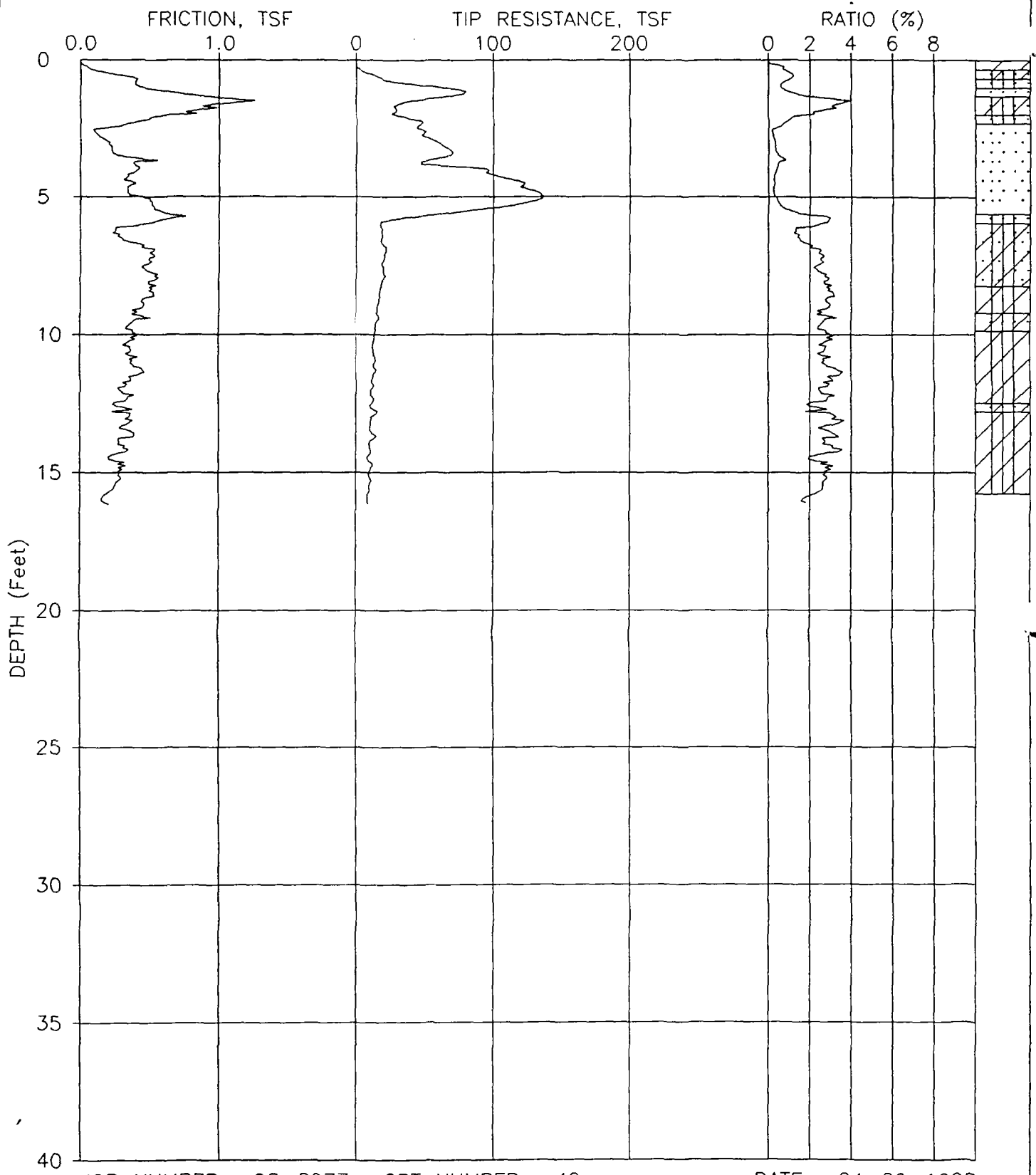




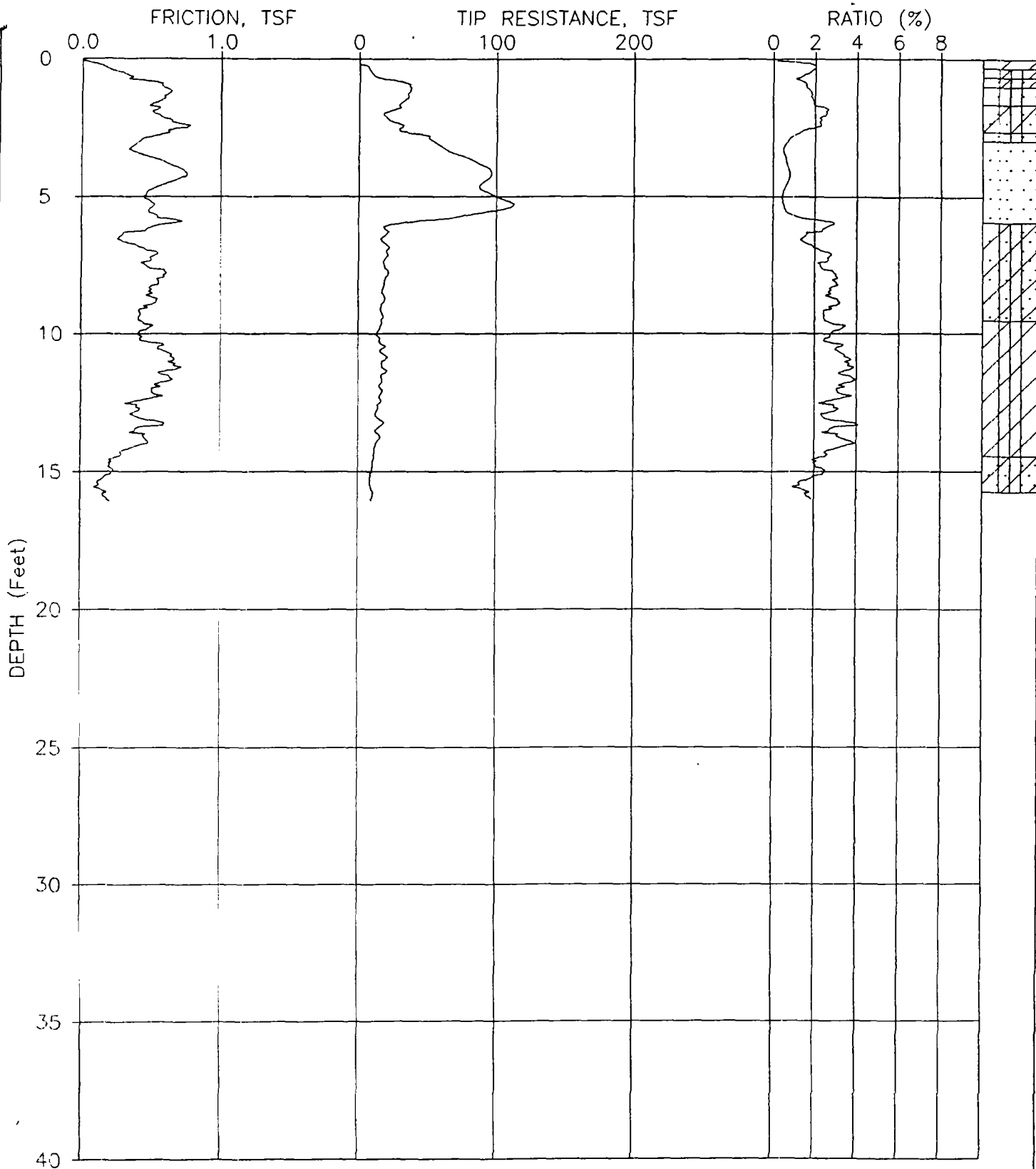
JOB NUMBER: 98-8077
ELEVATION: 0.00

CPT NUMBER: 48
CONE NUMBER: F7.5CKEV895

DATE: 04-29-1998
PLATE: 1 OF 1



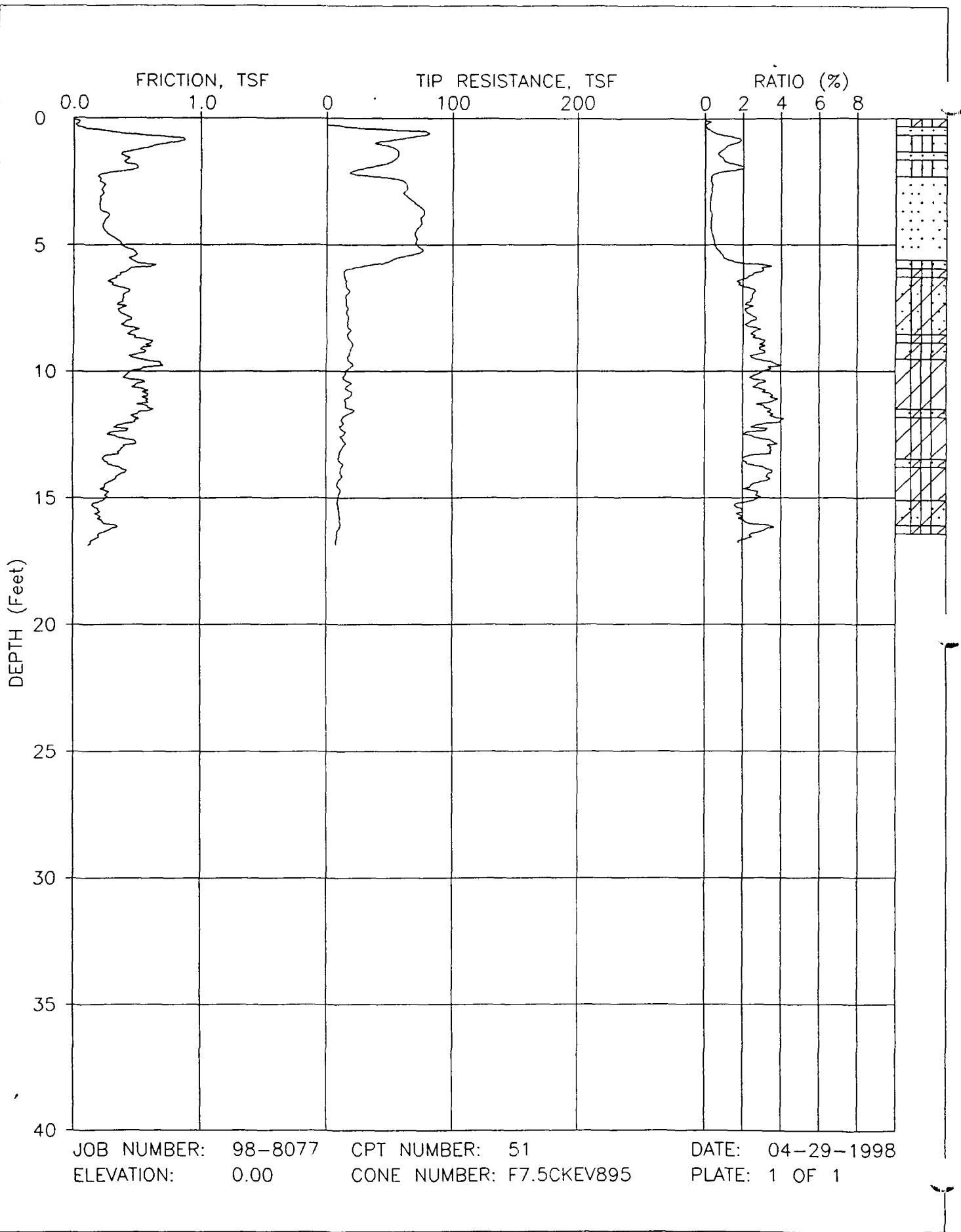
JOB NUMBER: 98-8077 CPT NUMBER: 49 DATE: 04-29-1998
ELEVATION: 0.00 CONE NUMBER: F7.5CKEV895 PLATE: 1 OF 1

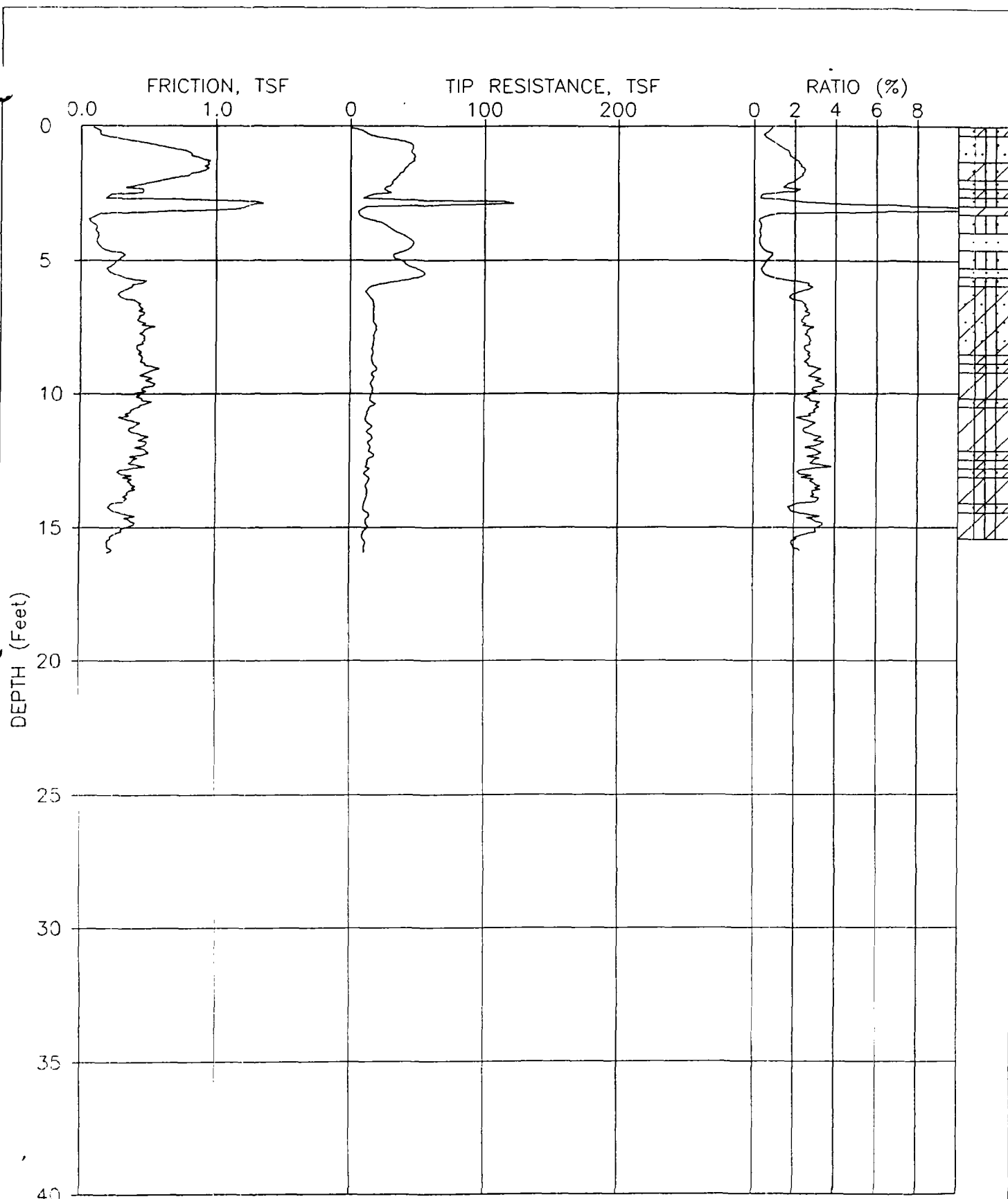


JOB NUMBER: 98-8077
ELEVATION: 0.00

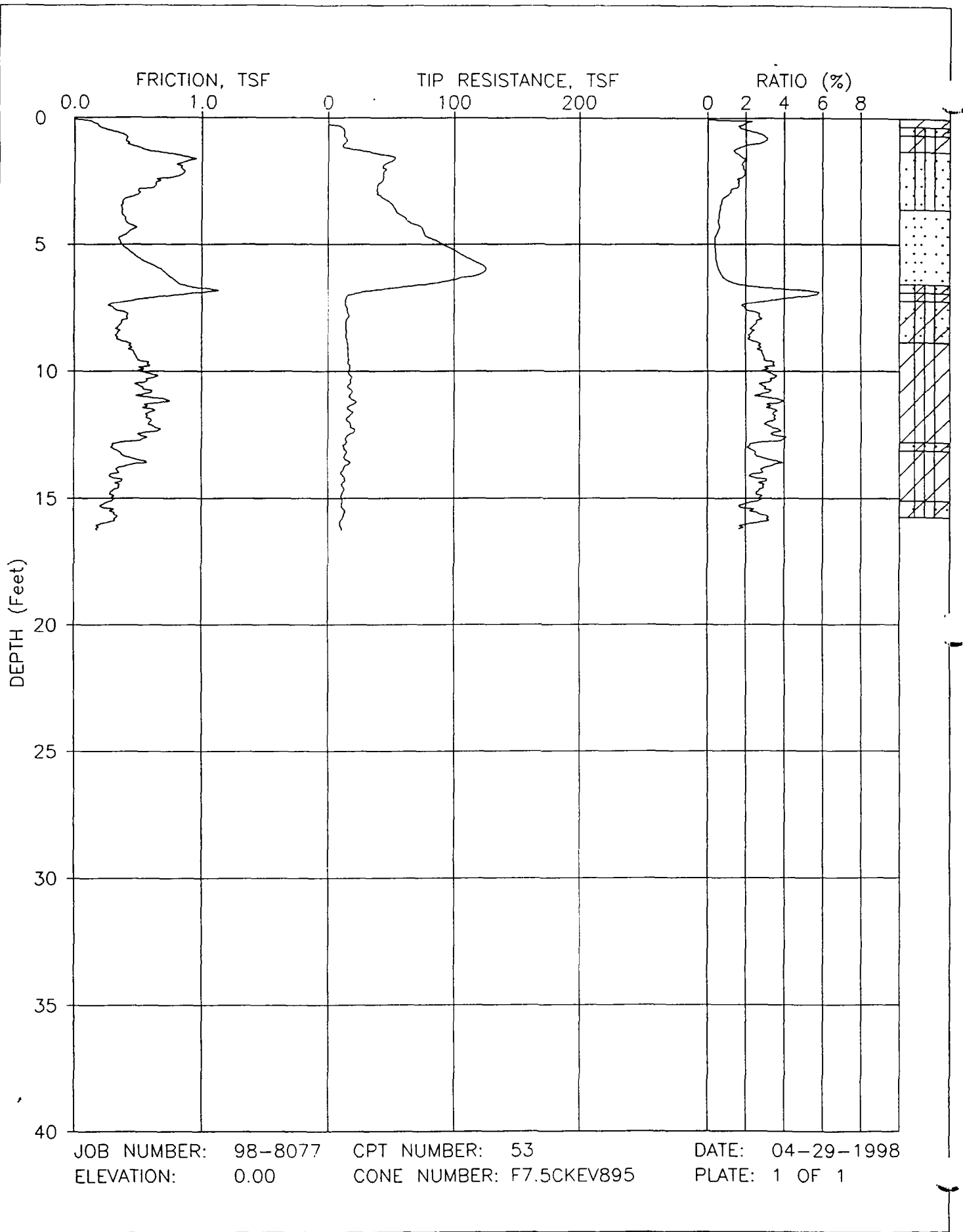
CPT NUMBER: 50
CONE NUMBER: F7.5CKEV895

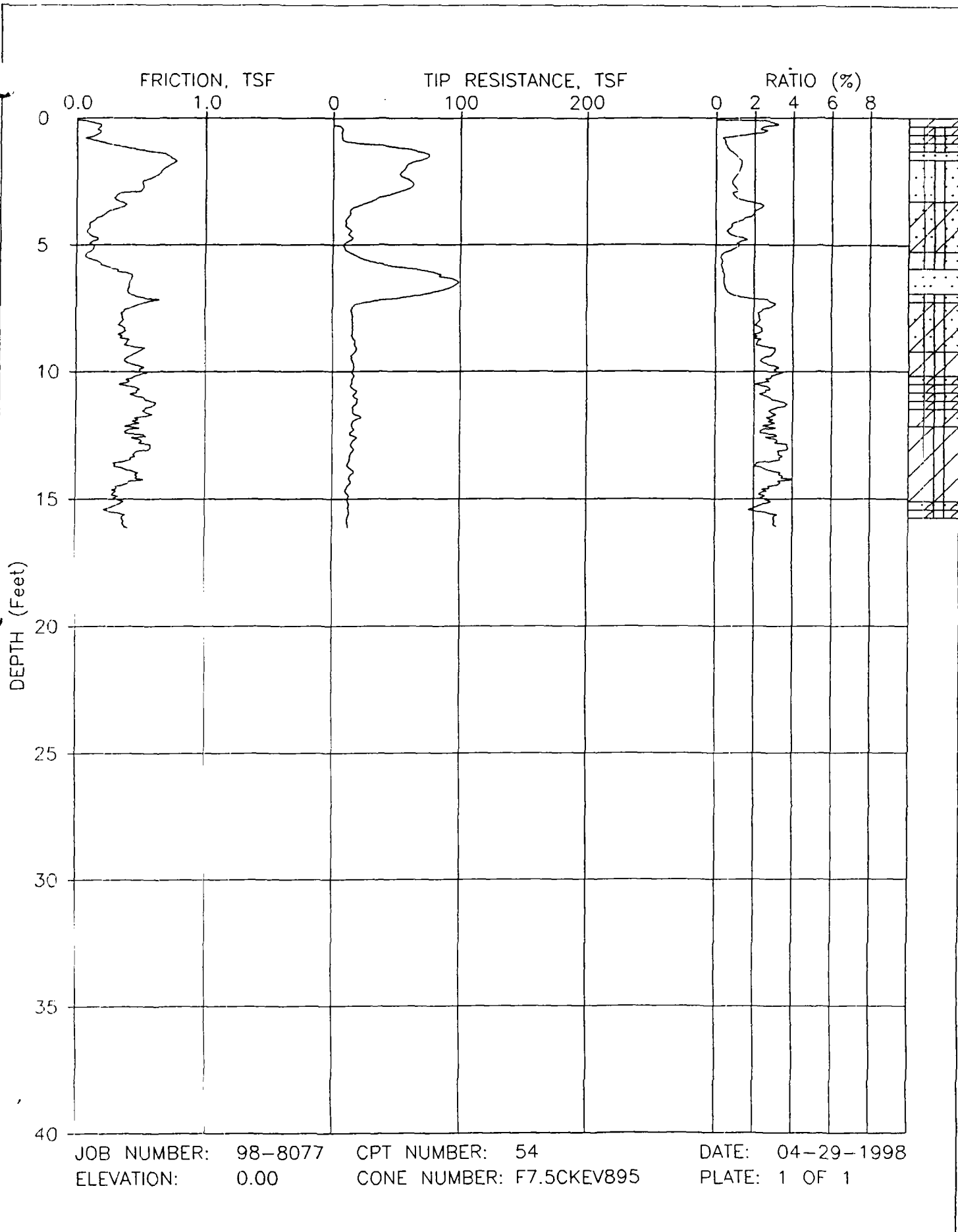
DATE: 04-29-1998
PLATE: 1 OF 1

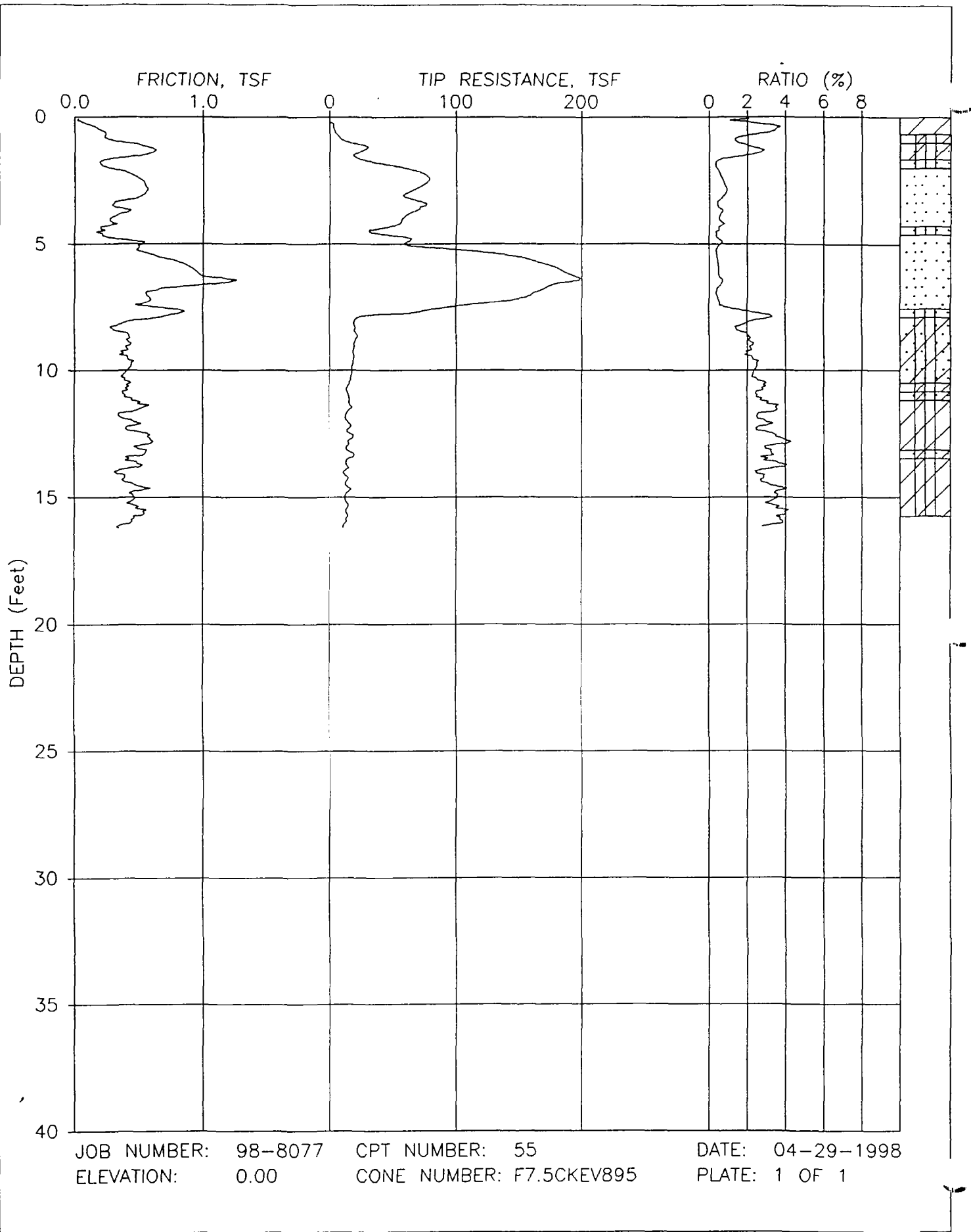




JOB NUMBER: 98-8077 CPT NUMBER: 52 DATE: 04-29-1998
ELEVATION: 0.00 CONE NUMBER: F7.5CKEV895 PLATE: 1 OF 1



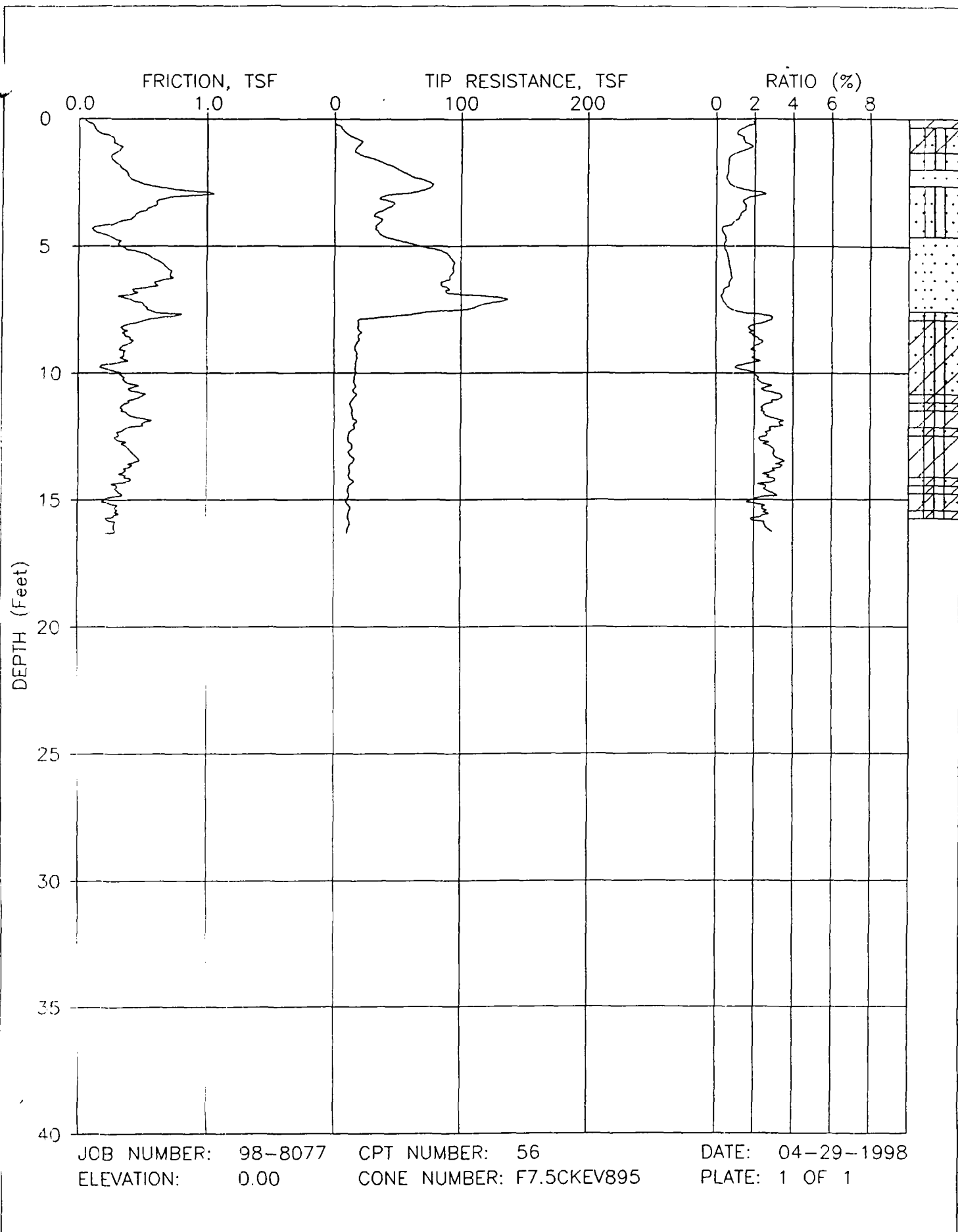




JOB NUMBER: 98-8077
ELEVATION: 0.00

CPT NUMBER: 55
CONE NUMBER: F7.5CKEV895

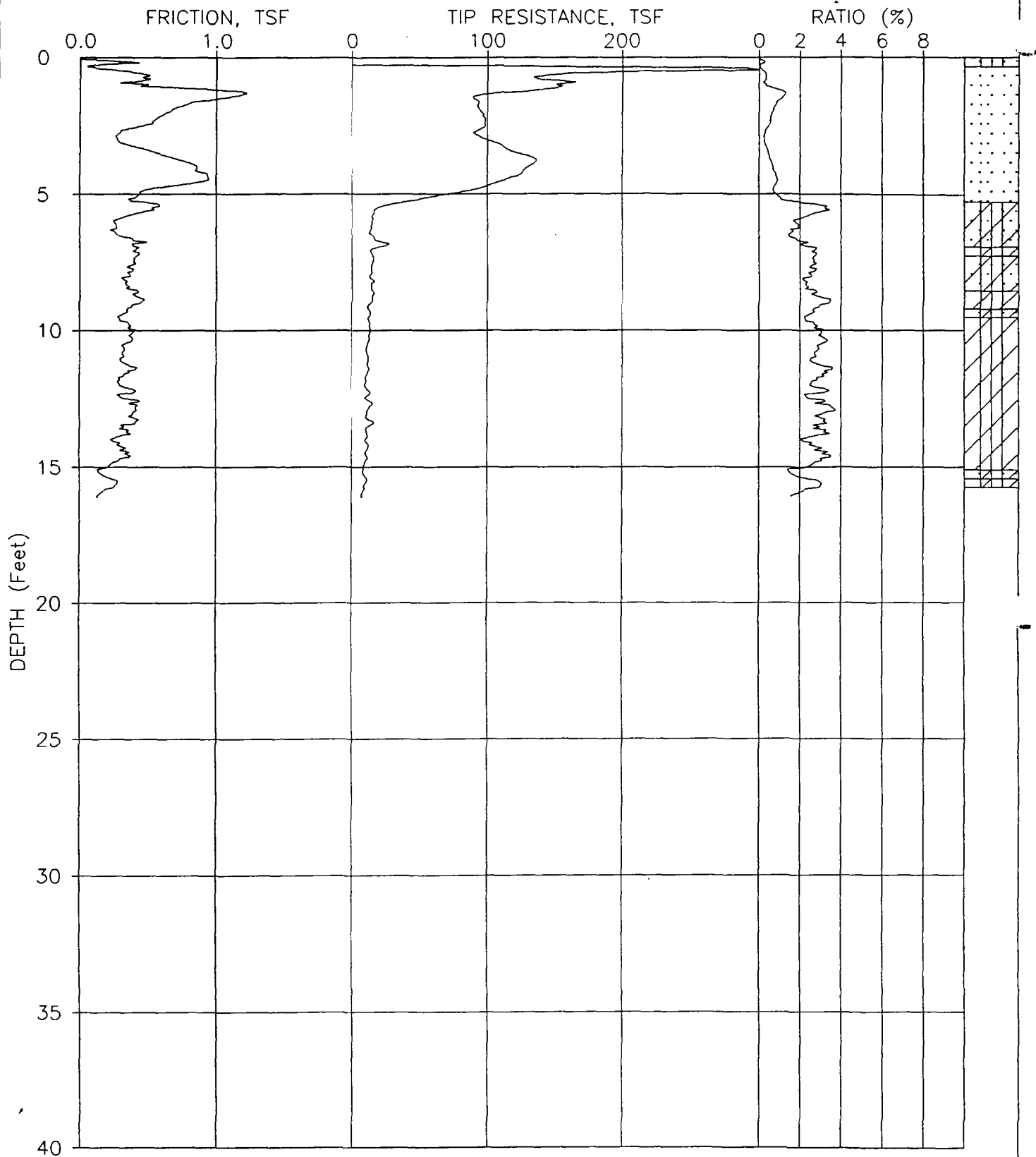
DATE: 04-29-1998
PLATE: 1 OF 1



JOB NUMBER: 98-8077
ELEVATION: 0.00

CPT NUMBER: 56
CONE NUMBER: F7.5CKEV895

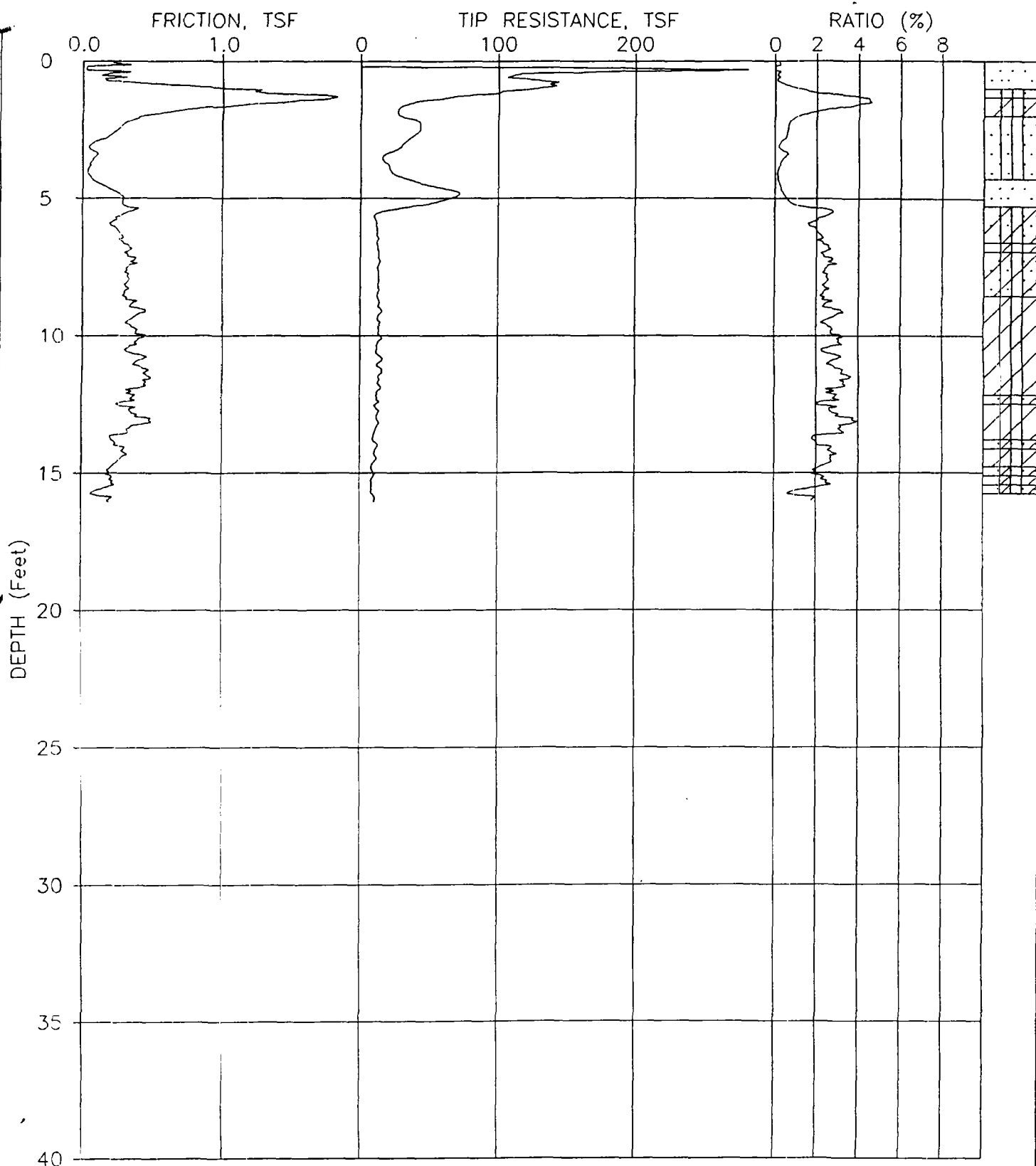
DATE: 04-29-1998
PLATE: 1 OF 1



JOB NUMBER: 98-8077
ELEVATION: 0.00

CPT NUMBER: 57
CONE NUMBER: F7.5CKEV895

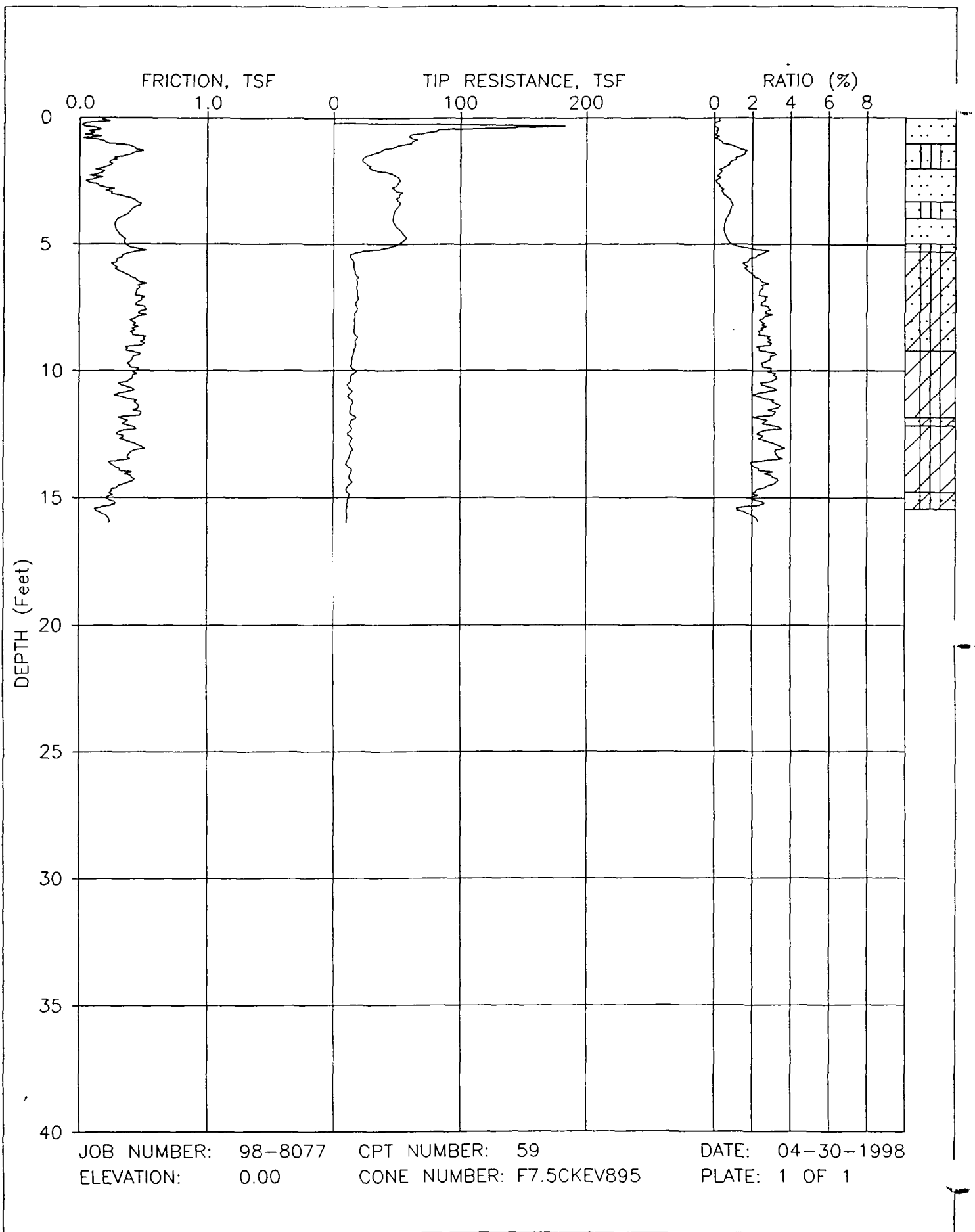
DATE: 04-30-1998
PLATE: 1 OF 1

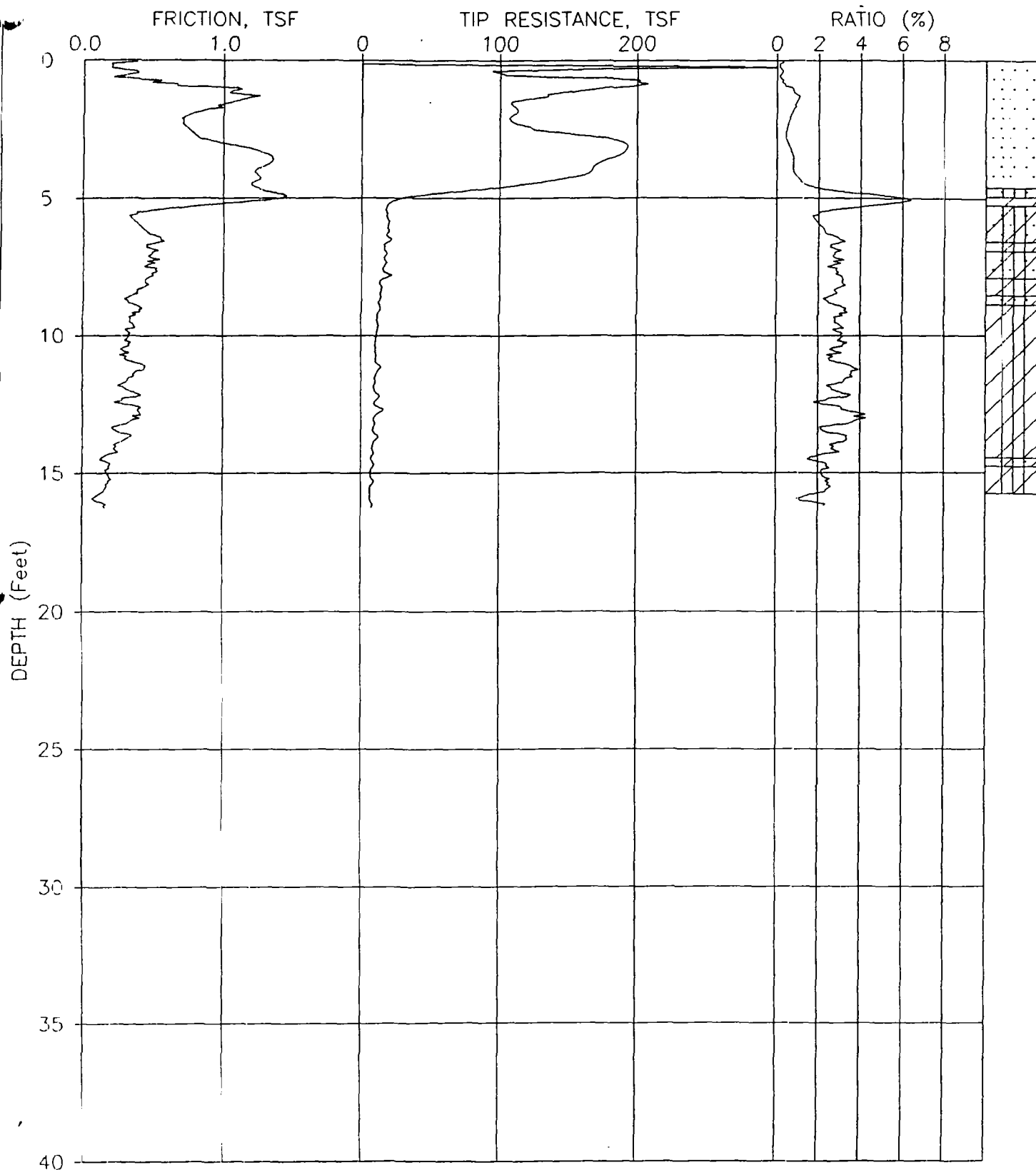


JOB NUMBER: 98-8077
ELEVATION: 0.00

CPT NUMBER: 58
CONE NUMBER: F7.5CKEV895

DATE: 04-30-1998
PLATE: 1 OF 1

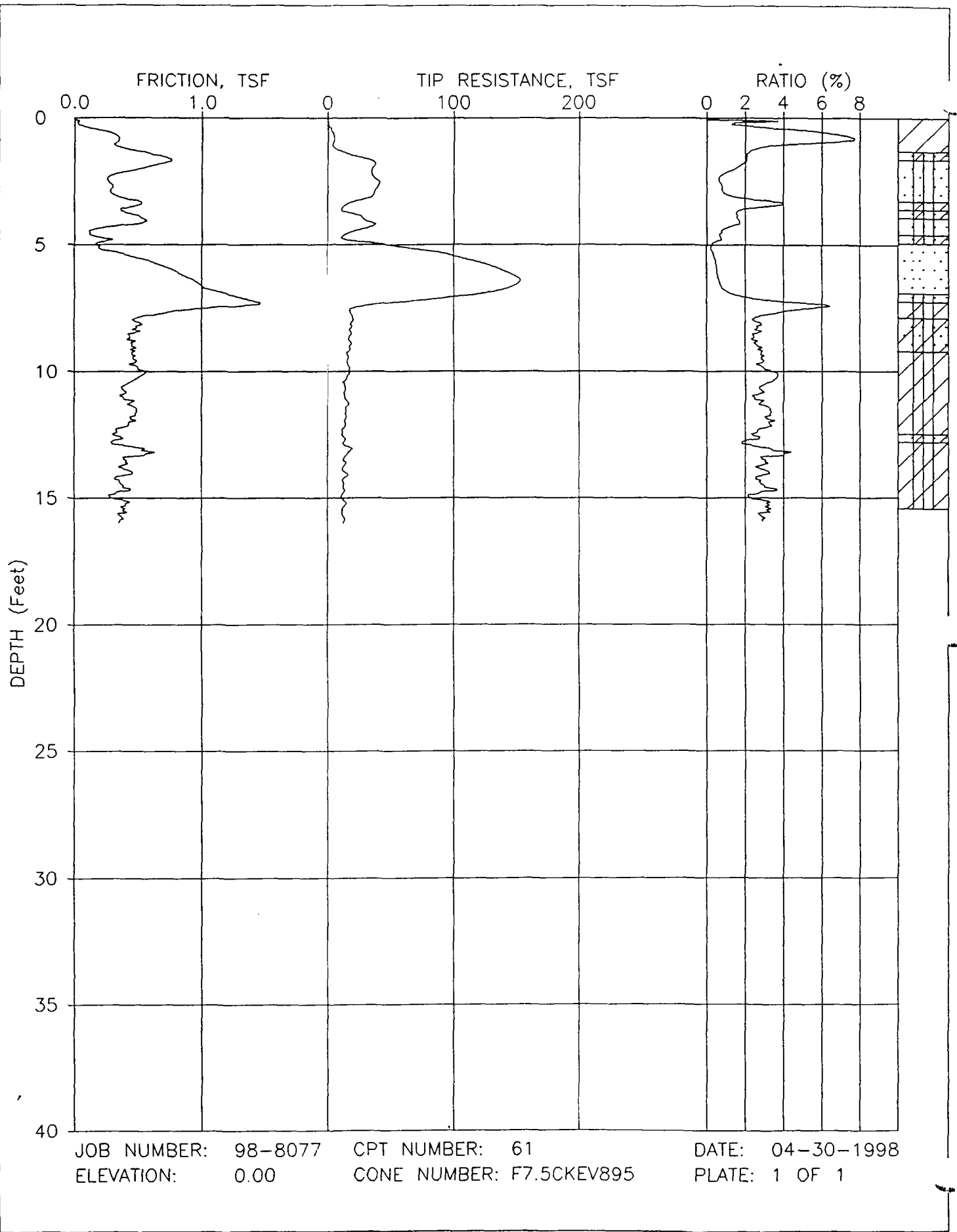


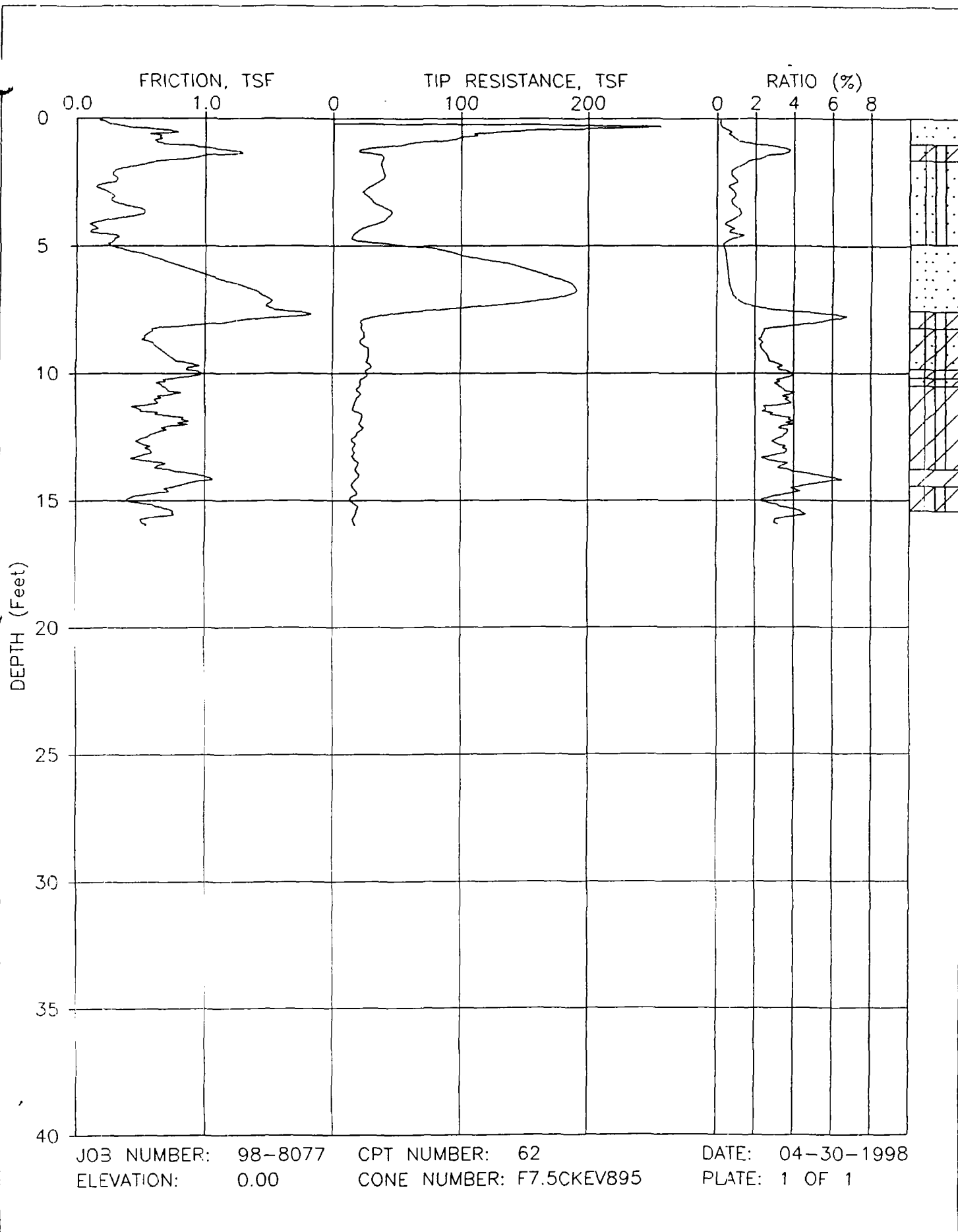


JOB NUMBER: 98-8077
ELEVATION: 0.00

CPT NUMBER: 60
CONE NUMBER: F7.5CKEV895

DATE: 04-30-1998
PLATE: 1 OF 1

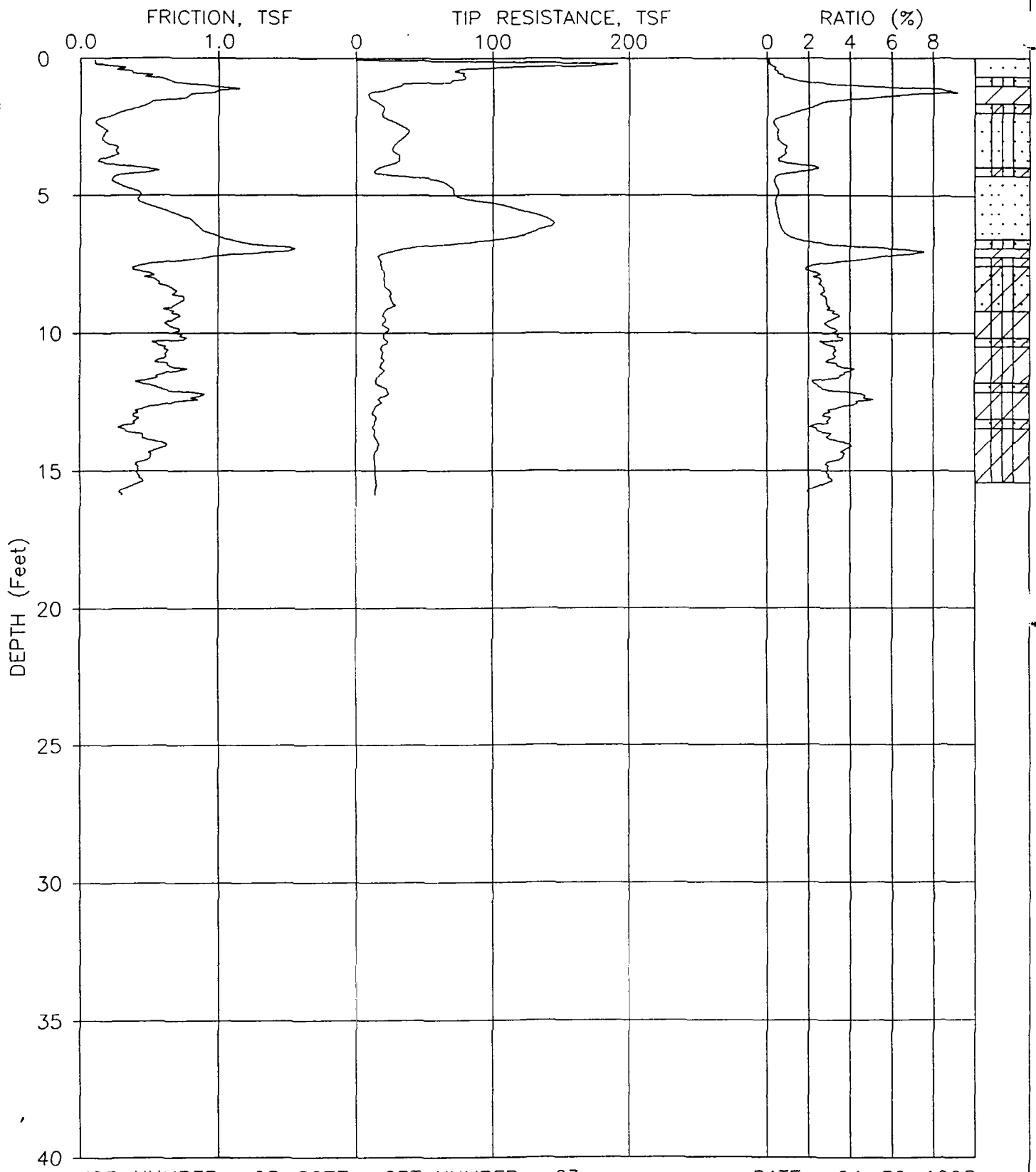




JOB NUMBER: 98-8077
ELEVATION: 0.00

CPT NUMBER: 62
CONE NUMBER: F7.5CKEV895

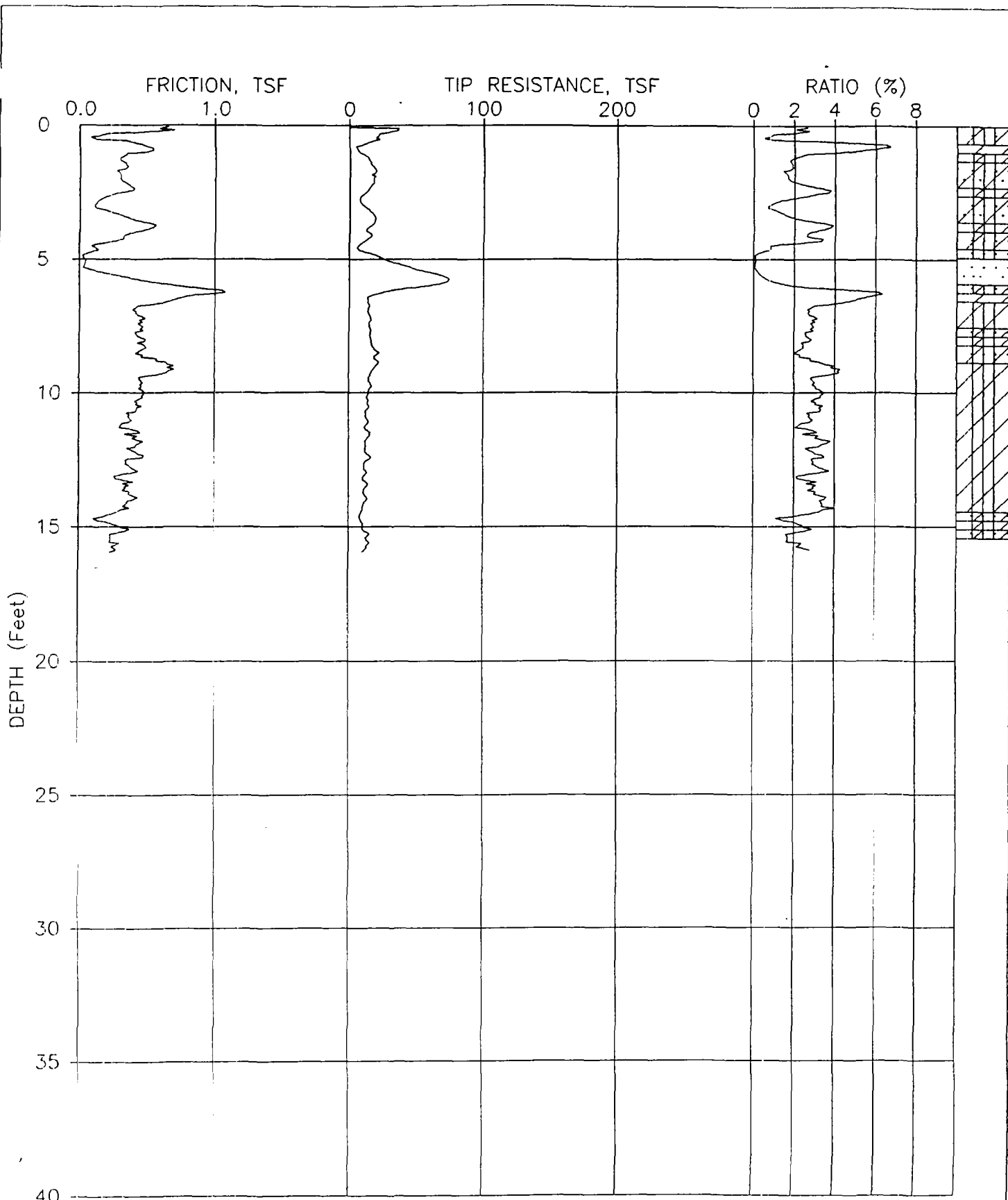
DATE: 04-30-1998
PLATE: 1 OF 1



JOB NUMBER: 98-8077
ELEVATION: 0.00

CPT NUMBER: 63
CONE NUMBER: F7.5CKEV895

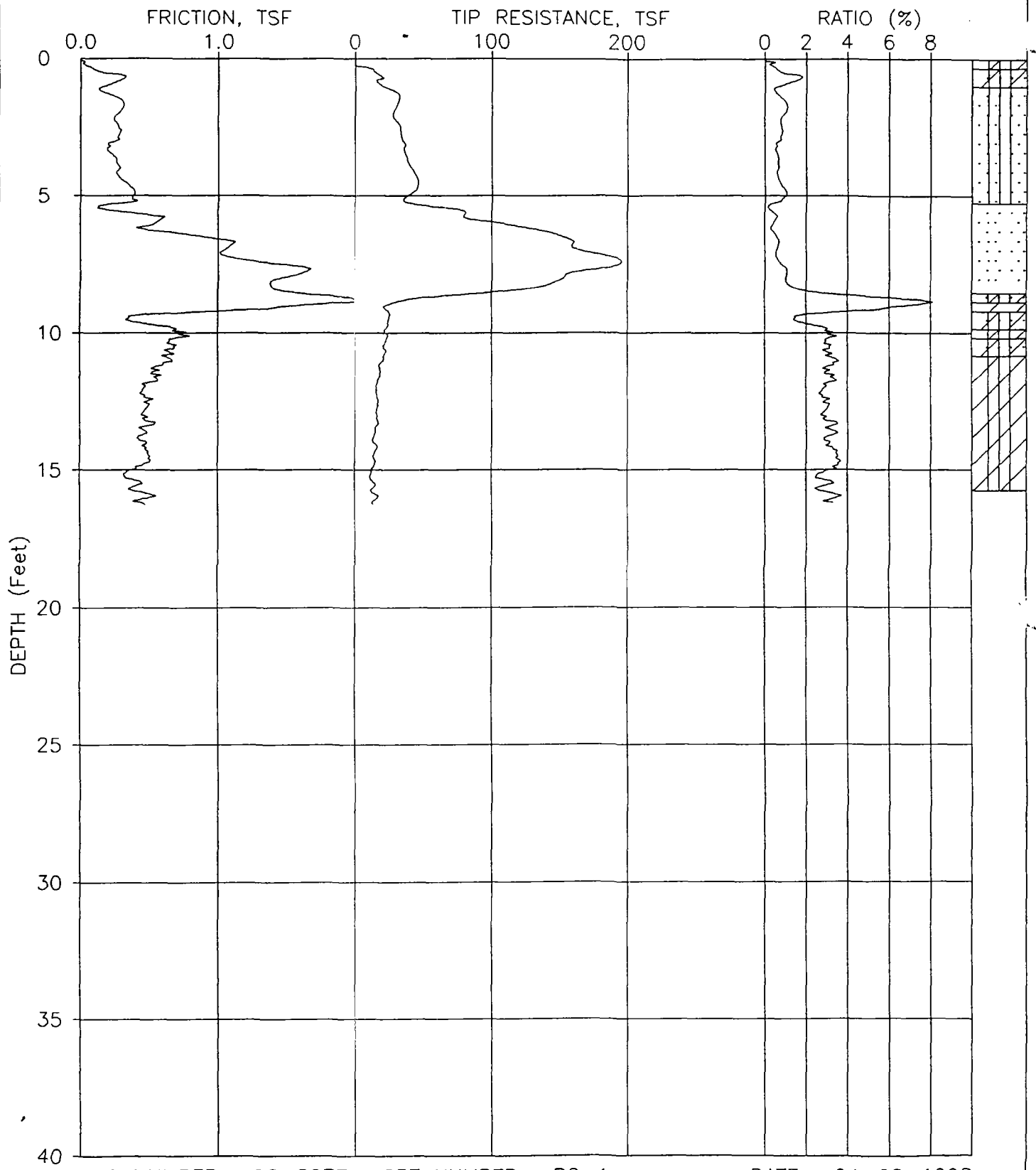
DATE: 04-30-1998
PLATE: 1 OF 1



JOB NUMBER: 98-8077
ELEVATION: 0.00

CPT NUMBER: 64
CONE NUMBER: F7.5CKEV895

DATE: 04-30-1998
PLATE: 1 OF 1



JOB NUMBER: 98-8077 CPT NUMBER: BG-1 DATE: 04-28-1998
ELEVATION: 0.00 CONE NUMBER: F7.5CKEV895 PLATE: 1 OF 1

SDMS US EPA Region V

Imagery Insert Form

**Some images in this document may be illegible or unavailable in SDMS.
Please see reason(s) indicated below:**

☐

Illegible due to bad source documents. Image(s) in SDMS is equivalent to hard copy.

Specify Type of Document(s) / Comment

☐

Confidential Business Information (CBI).

This document contains highly sensitive information. Due to confidentiality, materials with such information are not available in SDMS. You may contact the EPA Superfund Records Manager if you wish to view this document.

Specify Type of Document(s) / Comment

☒

Unscannable Material: Oversized X or Format.

Due to certain scanning equipment capability limitations, the document page(s) is not available in SDMS. The original document is available for viewing at the Superfund Records center.

Specify Type of Document(s) / Comment

☐

Other:

APPENDIX C

Geoprobe And Test Pit Logs

GEOLOGIC DRILL LOG					PROJECT Toledo Tie		PROJECT NUMBER PWM001		SHEET NO. 1 of 1		HOLE NUMBER SB-1		
SITE Toledo, OH				COORDINATES 1683448.09 / 719234.89			LOGGED BY Jeff Arp			CHECKED BY			
BEGUN 5/6/98		COMPLETED 5/6/98		DRILLER Terra Probe		DRILL EQUIPMENT Geoprobe				BORING DIA. 2"		TOTAL DEPTH 12	
CORE RECOVERY (FT./%) 10.4 / 87		CORE BOXES 0		SAMPLES 3		CASING STICKUP NA		GROUND ELEV. 624.98		DEPTH/ELEV. GROUND WATER 7 / 618.0 NA /		DEPTH/ELEV. TOP OF ROCK NA /	
SAMPLE TYPE 4 ft. Macro-core w/acetate liners				CASING DIA/LENGTH NA		NOTES Corresponds to CPT Boring BG-1							
SAMPLE NUMBER	LENGTH/RECOV. (feet)	BLOW COUNTS (8"-12"-8")	PID (ppm)	LAYER Elev. Depth	DEPTH	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture tastes, odor	DRILLING NOTES water levels, water return, character of drilling, etc.					
MC-1/ SS-1	4.0/3.4	NA	NA	624.5 .5	1		TOPSOIL. brown fine SAND: damp; loose, damp; rust staining (oxidation) @ moisture interface @ 3.0 ft.	Soil samples PWM001- SB1- SS3-0385 collected from the 8.0-11.0 feet interval.					
MC-2/ SS-2	4.0/4.0	NA	NA	619.5 5.3 619.2 5.8	2								
					3								
					4								
					5								
					6		gray brown SILT: seam. brown fine SAND: loose; shell fragments; saturated.						
					7		...same as above.						
MC-3/ SS-3	4.0/3.0	NA	NA		8								
					9								
					10								
					11		dark gray CLAY: with silt, laminated; damp; plastic.						
					12		end of boring, 12.0 ft.						
					13								
					14								

GEOLOGIC DRILL LOG				PROJECT Toledo Tie		PROJECT NUMBER PWM001		SHEET NO. 1 of 1		HOLE NUMBER SB-2		
SITE Toledo, OH				COORDINATES 1861773.99 / 718727.39		LOGGED BY Jeff Arp		CHECKED BY				
BEGUN 5/8/98		COMPLETED 5/8/98		DRILLER Terra Probe		DRILL EQUIPMENT Geoprobe				BORING DIA. 2"		
TOTAL DEPTH 5		CORE RECOVERY (FT./%) 3.4 / 68		CORE BOXES 0		SAMPLES 2		CASING STICKUP NA		GROUND ELEV. 821.17		
DEPTH/ELEV. GROUND WATER NA /		DEPTH/ELEV. TOP OF ROCK NA /		SAMPLE TYPE 4 ft. Macro-core w/acetate liners		CASING DIA/LENGTH NA		NOTES Corresponds to CPT Boring CPT-27				
SAMPLE NUMBER	LENGTH/RECOV. (feet)	BLOW COUNTS (8"-12"-8")	PID (ppm)	LAYER Elev. Depth	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor				DRILLING NOTES water levels, water return, character of drilling, etc.
MC-1/ SS-1	3.0/1.9	NA	NA					TOPSOIL: dark brown silty clay; damp; trace sand & gravel. black organic rich seam. ...same as above; with increased sand content. clayey SAND				
MC-2/ SS-2	2.0/1.5	NA	NA					dark gray CLAY: with fine silt seams; damp; small fine sand lenses. (lacustrine) end of boring, 5.0 ft.				Soil samples PWM001-SB2- SS2- D385 collected from the 2.0-3.5 feet interval.

HULL & ASSOCIATES, INC.

GEOLOGIC DRILL LOG						PROJECT Toledo Tie		PROJECT NUMBER PWM001		SHEET NO. 1 of 1		HOLE NUMBER SB-3	
SITE Toledo, OH				COORDINATES 1682348.79 / 719080.75				LOGGED BY Jeff Arp				CHECKED BY	
EQUIN 5/8/98		COMPLETED 5/8/98		DRILLER Terra Probe		DRILL EQUIPMENT Geoprobe				BORING DIA. 2"		TOTAL DEPTH 7	
CORE RECOVERY (FT./%) 5.8 / 83		CORE BOXES C		SAMPLES 2		CASING STICKUP NA		GROUND ELEV. 621.11		DEPTH/ELEV. GROUND WATER 3.5 / 617.6 NA /		DEPTH/ELEV. TOP OF ROCK NA /	
SAMPLE TYPE 4 ft. Macro-core w/acetate liners						CASING DIA/LENGTH NA		NOTES Corresponds to CPT Boring CPT-39					
SAMPLE NUMBER	LENGTH/RECOV. (feet)	BLOW COUNTS (6"-12"-8")	PTD (ppm)	LAYER Elev. Depth	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor	DRILLING NOTES water levels, water return, character of drilling, etc.				
MC-1/ SS-1	3.0/1.8	NA	NA					dark brown silty SAND : with little clay; damp; slightly cohesive.					
					1			...same as above; becomes mottled light brown/orange.					
					2			CLAY .					
					3								
					4			dark gray SILT : loose; <u>saturated</u> .					
MC-2/ SS-2	4.0/4.0	NA	NA		4			dark gray CLAY : with silt seams; damp; plastic; cohesive. (lacustrine)	Take an additional tube to 4 ft. to obtain enough sample.				
					5			SILT .					
					6			...same as clays above; lacustrine.					
					7			end of boring, 8.0 ft.					
					8								
					9								
					10								
					11								
					12								
					13								
					14								

Soil samples
PWM001- SB3-
SS2-0385
collected from the
3.5-5.5 feet
interval.

GEOLOGIC DRILL LOG						PROJECT Toledo Tie		PROJECT NUMBER PWM001		SHEET NO. 1 of 1		HOLE NUMBER SB-4	
SITE Toledo, OH				COORDINATES 1862167.54 / 718774.95		LOGGED BY Jeff Arp				CHECKED BY			
BEGUN 5/6/98		COMPLETED 5/6/98		DRILLER Terra Probe		DRILL EQUIPMENT Geoprobe				BORING DIA. 2"		TOTAL DEPTH 8	
CORE RECOVERY (FT./%) 7.5 / 94		CORE BOXES 0		SAMPLES 2		CASING STICKUP NA		GROUND ELEV. 621.90		DEPTH/ELEV. GROUND WATER NA /		DEPTH/ELEV. TOP OF ROCK NA /	
SAMPLE TYPE 4 ft. Macro-core w/acetate liners				CASING DIA./LENGTH NA		NOTES Corresponds to CPT Boring CPT-57							
SAMPLE NUMBER	LENGTH/RECOV. (feet)	BLOW COUNTS (8"-12"-8")	PID (ppm)	LAYER Elev. Depth	DEPTH	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor	DRILLING NOTES water levels, water return, character of drilling, etc.					
MC-1/ SS-1	4.0/3.5	NA	NA	621.7 2 621.3 .8	1		ASPHALT: with under layment loose gravel.	Soil samples PWM001-SB4- SS2- D385 collected from the 4.0-8.0 feet interval.					
					2		brown fine SAND: with some silt; loose; damp.						
					3		...same as above; becomes black in color; moist; slight chemical odor.						
MC-2/ SS-2	4.0/4.0	NA	NA		4		...same as above; becomes coarser sand; strong sheen.						
					5								
				616.4 5.5 615.9 6.0	6		gray SILT saturated; loose to slightly cohesive.						
					7		dark gray CLAY: with fine; damp; plastic; cohesive; (lacustrine).						
				613.9 8.0	8		end of boring, 8.0 ft.						
					9								
					10								
					11								
					12								
					13								
					14								

GEOLOGIC DRILL LOG						PROJECT Toledo Tie		PROJECT NUMBER PWM001		SHEET NO. 1 of 1		HOLE NUMBER SB-5	
SITE Toledo, OH				COORDINATES 1682057.92 / 718831.31		LOGGED BY Jeff Arp				CHECKED BY			
BEGUN 5/8/98		COMPLETED 5/8/98		DRILLER Terra Probe		DRILL EQUIPMENT Geoprobe				BORING DIA. 2"		TOTAL DEPTH 9	
CORE RECOVERY (FT./%) 8.0 / 89		CORE BOXES 0		SAMPLES 3		CASING STICKUP NA		GROUND ELEV. 620.92		DEPTH/ELEV. GROUND WATER NR / NA /		DEPTH/ELEV. TOP OF ROCK NA /	
SAMPLE TYPE 4 ft. Macro-core w/acetate liners				CASING DIA/LENGTH NA		NOTES Corresponde to CPT Boring CPT-4							
SAMPLE NUMBER	LENGTH/RECOV. (feet)	BLOW COUNTS (8"-12"-8")	PTD (ppm)	LAYER Elev. Depth	DEPTH	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor	DRILLING NOTES water levels, water return, character of drilling, etc.					
MC-1/ SS-1	4.0/3.5	NA	NA		1		mottled brown/black sandy CLAY : damp; cohesive; roots.	Soil samples PWM001-SB5- SS2- D385 collected from the 5.0-7.0 feet interval.					
				2	dark gray/black silty SAND : with sparse gravel; damp; loose to slightly cohesive.								
MC-2/ SS-2	1.0/1.0	NA	NA		3								
MC-2a/ SS-2	4.0/3.5	NA	NA		4								
				5	...same as above, strong odor and sheen.								
				6									
				7	dark gray CLAY : with silt seams; damp; plastic; sheen and product in silt seams in upper portion of unit.								
				8									
				9	end of boring, 9.0 ft.								
				10									
				11									
				12									
				13									
				14									

GEOLOGIC DRILL LOG				PROJECT Toledo Tie		PROJECT NUMBER PWM001		SHEET NO. 1 of 1		HOLE NUMBER SB-6	
SITE Toledo, OH				COORDINATES 1862054.27 / 718605.06		LOGGED BY Jeff Arp		CHECKED BY			
BEGUN 5/6/98		COMPLETED 5/6/98		DRILLER Terra Probe		DRILL EQUIPMENT Geoprobe		BORING DIA. 2"		TOTAL DEPTH 8.0	
CORE RECOVERY (FT.%) NR / NR		CORE BOXES 0		SAMPLES 2		CASING STICKUP NA		GROUND ELEV. 623.69		DEPTH/ELEV. GROUND WATER 8 / 617.7 NA /	
SAMPLE TYPE 4 ft. Macro-core w/acetate liners				CASING DIA/LENGTH NA		NOTES Corresponds to CPT Boring CPT-61					
SAMPLE NUMBER	LENGTH/RECOV. (feet)	BLOW COUNTS (8"-12"-8")	PID (ppm)	LAYER Elev. Depth	DEPTH	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor	DRILLING NOTES water levels, water return, character of drilling, etc.			
MC-1/ SS-1	4.0/NR	NA	NA				TOPSOIL: moist-wet.				
				622.7 1.0	1		brown fine SAND: with trace silt; loose; damp.				
					2						
					3						
MC-2/ SS-2	4.0/NR	NA	NA		4		...same as above; wet.				
				619.2 4.5							
				618.7 5.0	5		brown silty CLAY: with sand; damp; plastic; soft to firm; cohesive.				
							brown fine SAND: wet.				
					6		...same as above; gray in color; strong odor and sheen.				
					7						
				616.2 7.5							
				615.7 8.0	8		dark gray CLAY: with silt; (lacustrine). end of boring, 8.0 ft.	Soil samples PWM001-SB6- SS2- D385 collected from the 8.0-7.5 feet interval.			
					9						
					10						
					11						
					12						
					13						
					14			Acetate tube stuck in macro sampler, offset & redrilled. Field blank taken @ this location.			

GEOLOGIC DRILL LOG				PROJECT Toledo Tie		PROJECT NUMBER PWM001		SHEET NO. 1 of 1		HOLE NUMBER SB-7	
SITE Toledo, OH				COORDINATES 1662069.74 / 718730.01		LOGGED BY Jeff Arp		CHECKED BY			
BEGUN 5/6/98		COMPLETED 5/6/98		DRILLER Terra Probe		DRILL EQUIPMENT Geoprobe		BORING DIA. 2"		TOTAL DEPTH 10	
CORE RECOVERY (FT./%) 9.8 / 98		CORE BOXES 0		SAMPLES 3		CASING STICKUP NA		GROUND ELEV. 823.98		DEPTH/ELEV. GROUND WATER 5 / 619.0 NA /	
SAMPLE TYPE 4 ft. Macro-core w/acetate liners				CASING DIA/LENGTH NA		NOTES Corresponds to CPT Boring CPT-56					
SAMPLE NUMBER	LENGTH/RECOV. (feet)	BLOW COUNTS (8"-12"-8")	PID (ppm)	LAYER Elev. Depth	DEPTH	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor	DRILLING NOTES water levels, water return, character of drilling, etc.			
MC-1/ SS-1	4.0/4.0	NA	NA	623.5 .5	1		dark organic rich TOPSOIL : sand & silt; loose-slightly cohesive; damp.	Soil samples PWM001- SB7- SS2-D385 collected from the 7.0-9.5 feet interval.			
				622.5 1.5	2		light brown fine SAND : with silt.				
				620.3 3.7	4		dark brown silty fine SAND : little clay; moist; slightly cohesive.				
MC-2/ SS-2	4.0/3.8	NA	NA	619.0 5.0	5		gray fine SAND : loose <u>wet</u> .				
					6						
					7		Strong odor and sheen				
MC-3/ SS-3	2.0/3.5	NA	NA		8		sand coarsens with shell fragments; strong odor and sheen.				
				614.5 9.5	9						
				614.0 10.0	10		dark gray CLAY : with silt; (lacustrine). end of boring, 10.0 ft.				
					11						
					12						
					13						
					14						

GEOLOGIC DRILL LOG					PROJECT Toledo Tie		PROJECT NUMBER PWM001		SHEET NO. 1 of 1		HOLE NUMBER SB-8			
SITE Toledo, OH			COORDINATES 1861925.58 / 718785.09			LOGGED BY Jeff Arp			CHECKED BY					
BEGUN 5/8/98		COMPLETED 5/8/98		DRILLER Terra Probe		DRILL EQUIPMENT Geoprobe				BORING DIA. 2"		TOTAL DEPTH 8		
CORE RECOVERY (FT./%) 6.3 / 79			CORE BOXES 0		SAMPLES 2		CASING STICKUP NA		GROUND ELEV. 822.38		DEPTH/ELEV. GROUND WATER 4 / 818.4 NA /		DEPTH/ELEV. TOP OF ROCK NA /	
SAMPLE TYPE 4 ft. Macro-core w/acetate liners					CASING DIA/LENGTH NA		NOTES Corresponds to CPT Boring CFT-48							
SAMPLE NUMBER	LENGTH/RECOV. (feet)	BLOW COUNTS (8"-12"-8")	PIU (ppm)	LAYER Elev. Depth	DEPTH	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor				DRILLING NOTES water levels, water return, character of drilling, etc.			
MC-1/ SS-1	4.0/2.3	NA	NA		621.4 1.0	1	dark black sandy SILT: damp; loose to slightly cohesive; slightly plastic.				Soil samples PWM001- SB8- SS2-D385 collected from the 4.0-8.5 feet interval.			
					2	mottled brown/black/rust silty CLAY: with sand; damp; cohesive; slightly plastic; FILL								
					3									
MC-2/ SS-2	4.0/4.0	NA	NA	618.4 4.0	4	dark gray/gray black fine to medium SAND: loose; wet; strong odor and sheen.								
					5									
					615.9 6.5	6								
					7	dark gray CLAY: with silt; damp; plastic laminates; very thin fine gray sand seams; lacustrine.								
				614.4 8.0	8	end of boring, 8.0 ft.								
					9									
					10									
					11									
					12									
					13									
					14									


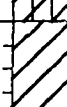

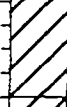





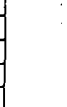




GEOLOGIC DRILL LOG						PROJECT Toledo Tie		PROJECT NUMBER PWM001		SHEET NO. 1 of 1		HOLE NUMBER SB-9	
SITE Toledo, OH				COORDINATES 1662233.71 / 718769.20		LOGGED BY Jeff Arp			CHECKED BY				
BEGUN 5/8/98		COMPLETED 5/8/98		DRILLER Terra Probe		DRILL EQUIPMENT Geoprobe			BORING DIA. 2"		TOTAL DEPTH 8		
CORE RECOVERY (FT.%) 7.8 / 95		CORE BOXES 0		SAMPLES 2		CASING STICKUP NA		GROUND ELEV. 820.91		DEPTH/ELEV. GROUND WATER NR / NA /		DEPTH/ELEV. TOP OF ROCK NA /	
SAMPLE TYPE 4 ft. Macro-core w/acetate liners						CASING DIA/LENGTH NA		NOTES Corresponds to CPT Boring CPT-16					
SAMPLE NUMBER	LENGTH/RECOV. (feet)	BLOW COUNTS (6"-12"-8")	PID (ppm)	LAYER Elev. Depth	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor	DRILLING NOTES water levels, water return, character of drilling, etc.				
MC-1/ SS-1	4.0/3.8	NA	NA					dark brown silty CLAY : with sand					
					618.9 2.0			light brown fine SAND : little silt; damp to moist; slightly cohesive					
					3								
MC-2/ SS-2	4.0/4.0	NA	NA										
					615.9 5.0			gray CLAY : laminated w/ silt & fine sand seams - seams possess odor and staining; damp; firm to soft (lacustrine).					
					6								
					7								
					612.9 8.0			end of boring, 8.0 ft.					
					9								
					10								
					11								
					12								
					13								
					14								

Soil samples
PWM001-SB9-
SS2- D385
collected from the
4.5-8.0 feet
interval.

GEOLOGIC DRILL LOG				PROJECT Toledo Tie		PROJECT NUMBER PWM001	SHEET NO. 1 of 1	HOLE NUMBER SB-10
SITE Toledo, OH			COORDINATES 1862081.78 / 718864.89		LOGGED BY Jeff Arp		CHECKED BY	
BEGUN 5/8/98	COMPLETED 5/8/98	DRILLER Terra Probe	DRILL EQUIPMENT Geoprobe			BORING DIA. 2"	TOTAL DEPTH 8	
CORE RECOVERY (FT./%) 7 / 87		CORE BOXES 0	SAMPLES 2	CASING STICKUP NA	GROUND ELEV. 821.97	DEPTH/ELEV. GROUND WATER NR / NA /	DEPTH/ELEV. TOP OF ROCK NA /	
SAMPLE TYPE 4 ft. Macro-core w/acetate liners			CASING DIA/LENGTH NA		NOTES Corresponds to CPT Boring CPT-58			






SAMPLE NUMBER	LENGTH/RECOV. (feet)	BLOW COUNTS (8"-12"-8")	PID (ppm)	LAYER Elev. Depth	DEPTH	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION <i>density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor</i>	DRILLING NOTES <i>water levels, water return, character of drilling, etc.</i>
MC-1/ SS-1	4.0/3.0	NA	NA		1		dark brown (organic rich) SILT : with root material; loose to slightly cohesive	
					2		dark gray fine SAND : with little silt; damp; loose to slightly cohesive.	
					3		...same as above.	
MC-2/ SS-2	4.0/4.0	NA	NA		4		Strong Odor & Sheen (Free Product)	
					5			
					6		Dark gray CLAY : with silt and sand seams (thin);	
					7			
					8		end of boring, 8.0 ft.	
					9			
					10			
					11			
					12			
					13			
					14			






GEOLOGIC DRILL LOG						PROJECT Toledo Tie		PROJECT NUMBER PWM001		SHEET NO. 1 of 1		HOLE NUMBER TP-1	
SITE Toledo, OH				COORDINATES 1862345.57 / 718986.30				LOGGED BY Jeff Arp		CHECKED BY			
BEGUN 5/7/98		COMPLETED 5/7/98		DRILLER Heritage		DRILL EQUIPMENT Backhoe				BORING DIA. PIT		TOTAL DEPTH 7.8	
CORE RECOVERY (FT./%) NA / NA				CORE BOXES 0		SAMPLES 0		CASING STICKUP NA		GROUND ELEV. 821.23		DEPTH/ELEV. GROUND WATER NA / NA /	
SAMPLE TYPE 2 ft. WIDE BUCKET						CASING DIA/LENGTH NA		NOTES Corresponds to CPT Boring CPT-40					
SAMPLE NUMBER	LENGTH/RECOV. (feet)	BLOW COUNTS (8"-12"-8")	PID (ppm)	LAYER Elev. Depth	DEPTH	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor				DRILLING NOTES water levels, water return, character of drilling, etc.		
					1		Mottled brown and orange silty CLAY: with sand; becomes less mottled with depth				No detectable odors or staining observed		
					2								
					3								
					4								
					5								
					6								
				615.1 6.1	6		dark gray CLAY (Lacustrine)				Very little water entering excavation		
					7								
					8								
					9								
					10								
					11								
					12								
					13								
				613.6 7.8	7		BASE OF PIT				Excavated material returned to Pit per EPA approval		
					8								
					9								
					10								
					11								
					12								
					13								
					14								

GEOLOGIC DRILL LOG				PROJECT Toledo Tie		PROJECT NUMBER PWM001		SHEET NO. 1 of 1		HOLE NUMBER TP-2	
SITE Toledo, OH				COORDINATES 1682237.25 / 719097.28		LOGGED BY Jeff Arp		CHECKED BY			
BEGUN 5/7/98		COMPLETED 5/7/98		DRILLER Heritage		DRILL EQUIPMENT Backhoe		BORING DIA. PIT		TOTAL DEPTH 9.6	
CORE RECOVERY (FT./%) NA / NA		CORE BOXES 0		SAMPLES 0		CASING STICKUP NA		GROUND ELEV. 621.00		DEPTH/ELEV. GROUND WATER NA / NA /	
SAMPLE TYPE 2 ft. WIDE BUCKET				CASING DIA/LENGTH NA		NOTES Corresponds to CPT Boring CPT-38					
SAMPLE NUMBER	LENGTH/RECOV. (feet)	BLOW COUNTS (6"-12"-8")	PID (ppm)	LAYER Elev. Depth	DEPTH	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor	DRILLING NOTES water levels, water return, character of drilling, etc.			
					1		dark brown silty CLAY : with sand				
					2		mottled brown/orange/gray silty CLAY : damp; plastic (very weathered lacustrine deposit)				
					3						
					4						
					5		becomes brown (water flowing into hole out of interface)				
					6						
					7						
					8		small sand seam				
					9						
					10		BASE OF PIT				
					11						
					12						
					13						
					14						

Significant amount
of water entering
pit

Excavated
material returned
to Pit per EPA
approval

GEOLOGIC DRILL LOG				PROJECT Toledo Tie		PROJECT NUMBER PWM001	SHEET NO. 1 of 1	HOLE NUMBER TP-3
SITE Toledo, OH			COORDINATES 1662074.58 / 719014.87		LOGGED BY Jeff Arp		CHECKED BY	
BEGUN 5/7/98	COMPLETED 5/7/98	DRILLER Heritage	DRILL EQUIPMENT Backhoe			BORING DIA. PIT	TOTAL DEPTH 6.0	
CORE RECOVERY (FT./%) NA / NA		CORE BOXES 0	SAMPLES 0	CASING STICKUP NA	GROUND ELEV. 821.51	DEPTH/ELEV. GROUND WATER NA / NA /		DEPTH/ELEV. TOP OF ROCK NA /
SAMPLE TYPE 2 ft. WIDE BUCKET			CASING DIA/LENGTH NA		NOTES Corresponds to CPT Boring CPT-35			
SAMPLE NUMBER	LENGTH/RECOV. (feet)	BLOW COUNTS (8"-12"-8")	PID (ppm)	LAYER Elev. Depth	DEPTH	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor	DRILLING NOTES water levels, water return, character of drilling, etc.
				620.0 1.5	1		dark brown clayey SILT : Dry	
					2		mottled lt. brown/orange silty SAND :	
				618.5 3.0	3		brown fine SAND : with silt; <u>wet</u>	
				618.0 3.5	4		mottled brown/gray silty CLAY : plastic; damp to moist	
				615.5 6.0	6		BASE OF PIT	No detectable odor or staining
					7			Excavated materials returned to Pit per EPA approval
					8			
					9			
					10			
					11			
					12			
					13			
					14			

GEOLOGIC DRILL LOG				PROJECT Toledo Tie		PROJECT NUMBER PWM001	SHEET NO. 1 of 1	HOLE NUMBER TP-4	
SITE Toledo, OH			COORDINATES 1662047.84 / 718940.13		LOGGED BY Jeff Arp		CHECKED BY		
BEGUN 5/7/98	COMPLETED 5/7/98	DRILLER Heritage	DRILL EQUIPMENT Backhoe			BORING DIA. PIT	TOTAL DEPTH 5.3		
CORE RECOVERY (FT./%) NA / NA		CORE BOXES 0	SAMPLES 0	CASING STICKUP NA	GROUND ELEV. 620.97	DEPTH/ELEV. GROUND WATER NA / NA /	DEPTH/ELEV. TOP OF ROCK NA /		
SAMPLE TYPE 2 ft. WIDE BUCKET			CASING DIA/LENGTH NA		NOTES Corresponds to CPT Boring CPT-33				
SAMPLE NUMBER	LENGTH/RECOV. (feet)	BLOW COUNTS (8"-12"-8")	PID (ppm)	LAYER Elev. Depth	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor	DRILLING NOTES water levels, water return, character of drilling, etc.
				620.0 1.0	1			dark brown sandy SILT : with clay; slightly cohesive; damp	
					2			mottled silty SAND :	
				618.5 2.5				dark gray (stained) SAND : wet	
				618.0 3.0	3			silty SAND :	
				617.0 4.0	4			brown and gray silty CLAY : damp; plastic	PID/FID air readings range from 8.3 to 8.4 ppm
				615.7 5.3	5			BASE OF PIT	Excavated materials returned to Pit per EPA approval
					6				
					7				
					8				
					9				
					10				
					11				
					12				
					13				
					14				

GEOLOGIC DRILL LOG						PROJECT Toledo Tie		PROJECT NUMBER PWMO01		SHEET NO. 1 of 1		HOLE NUMBER TP-5	
SITE Toledo, OH				COORDINATES 1861925.58 / 718785.09				LOGGED BY Jeff Arp				CHECKED BY	
BEGUN 5/7/98		COMPLETED 5/7/98		DRILLER Heritage		DRILL EQUIPMENT Backhoe				BORING DIA. PIT		TOTAL DEPTH 7.5	
CORE RECOVERY (FT./%) NA / NA		CORE BOXES 0		SAMPLES 0		CASING STICKUP NA		GROUND ELEV. 622.38		DEPTH/ELEV. GROUND WATER NA / NA /		DEPTH/ELEV. TOP OF ROCK NA /	
SAMPLE TYPE 2 ft. WIDE BUCKET				CASING DIA/LENGTH NA		NOTES Corresponds to CPT Boring CPT-48							
SAMPLE NUMBER	LENGTH/RECOV. (feet)	BLOW COUNTS (8"-12"-8")	P10 (ppm)	LAYER Elev. Depth	DEPTH	GRAPHIC LOG SAMPLE	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor	DRILLING NOTES water levels, water return, character of drilling, etc.					
					621.4 1.0	1	light brown fine SAND						
					2		dark brown to gray mottled silty SAND: with clay; cohesive						
					3								
					618.4 4.0	4	approximately 3 inch seam (creosote rich)	Staining @ 3.9 to 4.0 feet					
					5			Free Product oozing into Pit Jar of soils and product taken					
					615.9 6.5	6							
					614.9 7.5	7	gray CLAY: (Lacustrine)						
							BASE OF PIT	Excavated materials returned to Pit per EPA approval					
					8								
					9								
					10								
					11								
					12								
					13								
					14								

GEOLOGIC DRILL LOG						PROJECT Toledo Tie		PROJECT NUMBER PWM001		SHEET NO. 1 of 1		HOLE NUMBER TP-6	
SITE Toledo, OH				COORDINATES 1662069.74 / 718730.01				LOGGED BY Jeff Arp				CHECKED BY	
BEGUN 5/7/98		COMPLETED 5/7/98		DRILLER Heritage		DRILL EQUIPMENT Backhoe				BORING DIA. PIT		TOTAL DEPTH 7.5	
CORE RECOVERY (FT./%) NA / NA		CORE BOXES 0		SAMPLES 0		CASING STICKUP NA		GROUND ELEV. 622.38		DEPTH/ELEV. GROUND WATER NA / NA /		DEPTH/ELEV. TOP OF ROCK NA /	
SAMPLE TYPE 2 ft. WIDE BUCKET						CASING DIA/LENGTH NA		NOTES Corresponds to CPT Boring CPT-56					
SAMPLE NUMBER	LENGTH/RECOV. (feet)	BLOW COUNTS (6"-12"-6")	PID (ppm)	LAYER Elev. Depth	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION density, grain size/shape, color, structure composition, sorting, texture, moisture facies, odor	DRILLING NOTES water levels, water return, character of drilling, etc.				
				621.4 1.0	1			dark organic rich silty SAND: fades to lighter with depth					
					2			Light brown fine SAND					
					3								
				618.4 4.0	4			gray fine SAND: wet					
					5								
				615.9 6.5	6								
					7			Strong staining, sheen & Free Product					
				614.9 7.5	7			BASE OF PIT					
					8								
					9								
					10								
					11								
					12								
					13								
					14								

Test Pit terminated due to excessive amount of water and contaminants in Pit

Excavated materials returned to Pit per EPA approval

Jar of soils and product taken

APPENDIX D
Geologic Cross Sections

SDMS US EPA Region V

Imagery Insert Form

**Some images in this document may be illegible or unavailable in SDMS.
Please see reason(s) indicated below:**

☐

Illegible due to bad source documents. Image(s) in SDMS is equivalent to hard copy.

Specify Type of Document(s) / Comment

☐

Confidential Business Information (CBI).

This document contains highly sensitive information. Due to confidentiality, materials with such information are not available in SDMS. You may contact the EPA Superfund Records Manager if you wish to view this document.

Specify Type of Document(s) / Comment

☒

Unscannable Material: Oversized X or Format.

Due to certain scanning equipment capability limitations, the document page(s) is not available in SDMS. The original document is available for viewing at the Superfund Records center.

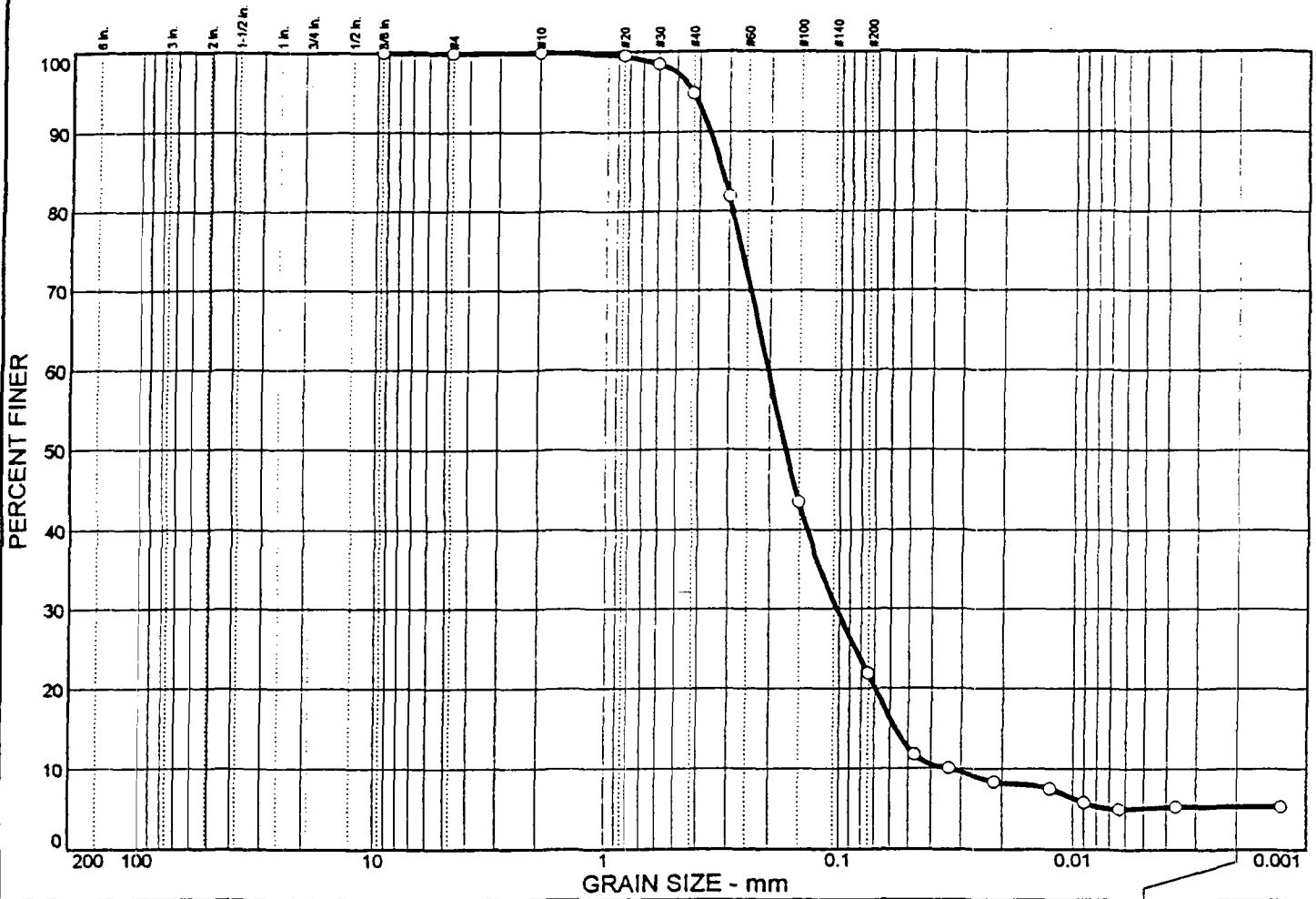
Specify Type of Document(s) / Comment

☐

Other:

APPENDIX E
Geotechnical Data

USCS Particle Size Distribution Report



	% + 3"	% GRAVEL		% SAND			% FINES			
		CRS.	FINE	CRS.	MEDIUM	FINE	SILT		CLAY	
○	0.0	0.0	0.1	0.0	5.1	72.9	16.6		5.3	
×	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
○	NP	NP	0.320	0.204	0.171	0.103	0.0569	0.0338	1.53	6.03
MATERIAL DESCRIPTION								USCS	AASHTO	
○ BROWN SILTY SAND								SM		

Project No. PWM-001 **Client:** KERR-McGEE CHEMICAL, LLC

Project: TOLEDO TIE TREATMENT SITE

○ Location: 98-567 CPT BG-1 SB-1 DEPTH: 5.0-8.0'

Remarks:

TESTED BY: RM/MJG

CHECKED BY: JPL

NATURAL MOISTURE: 23.2%

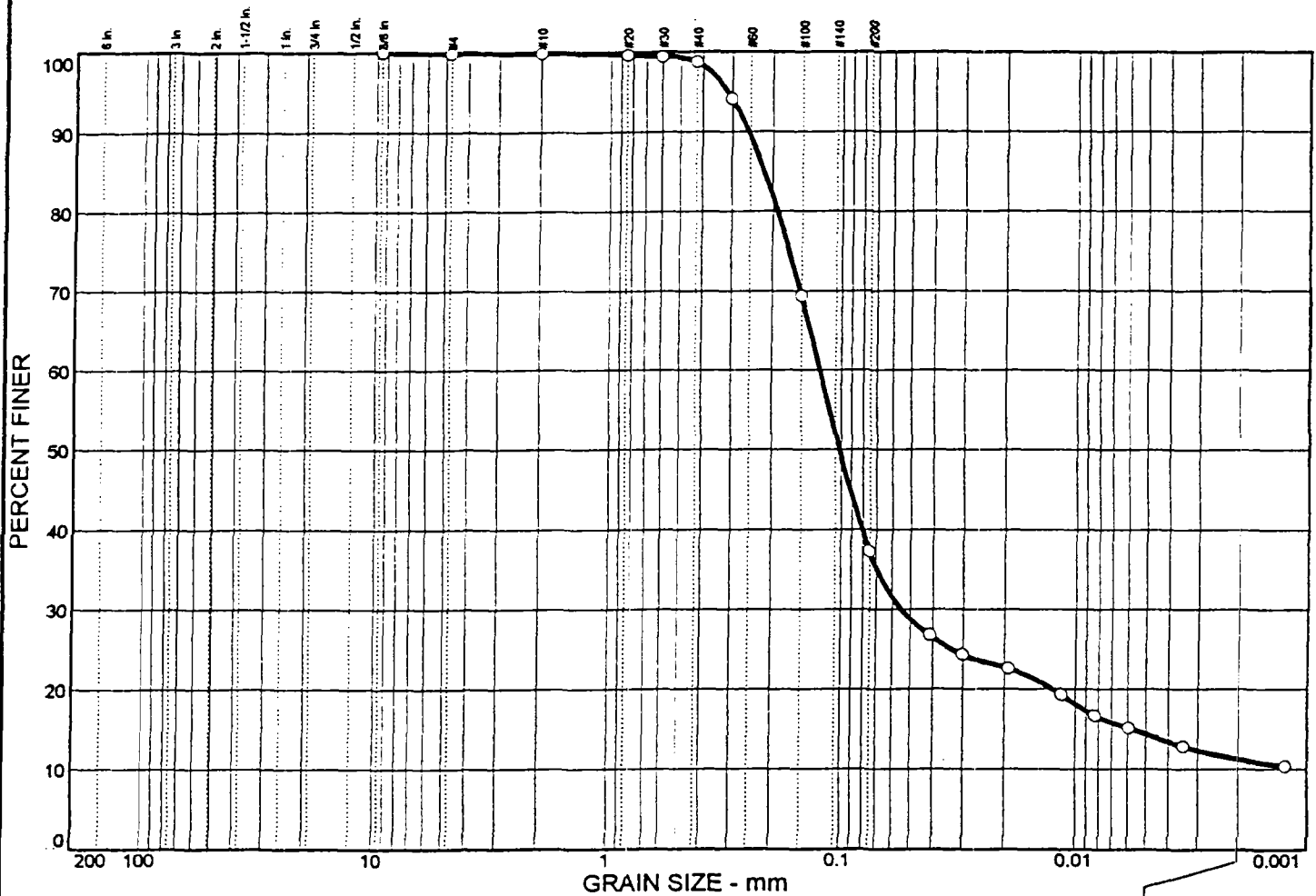
SPECIFIC GRAVITY: 2.63

USCS Particle Size Distribution Report

HULL & ASSOCIATES, INC.

FIGURE NUMBER

USCS Particle Size Distribution Report

[illegible]

MATERIAL DESCRIPTION	USCS	AASHTO
○ BROWN/GREY SILTY SAND	SM	

Project No. PWM-001 Client: KERR-McGEE CHEMICAL, LLC
Project: TOLEDO TIE TREATMENT SITE

○ Location: 98-568 SB-3 CPT-39(SAND) DEPTH: 4.0-8.0'

Remarks:

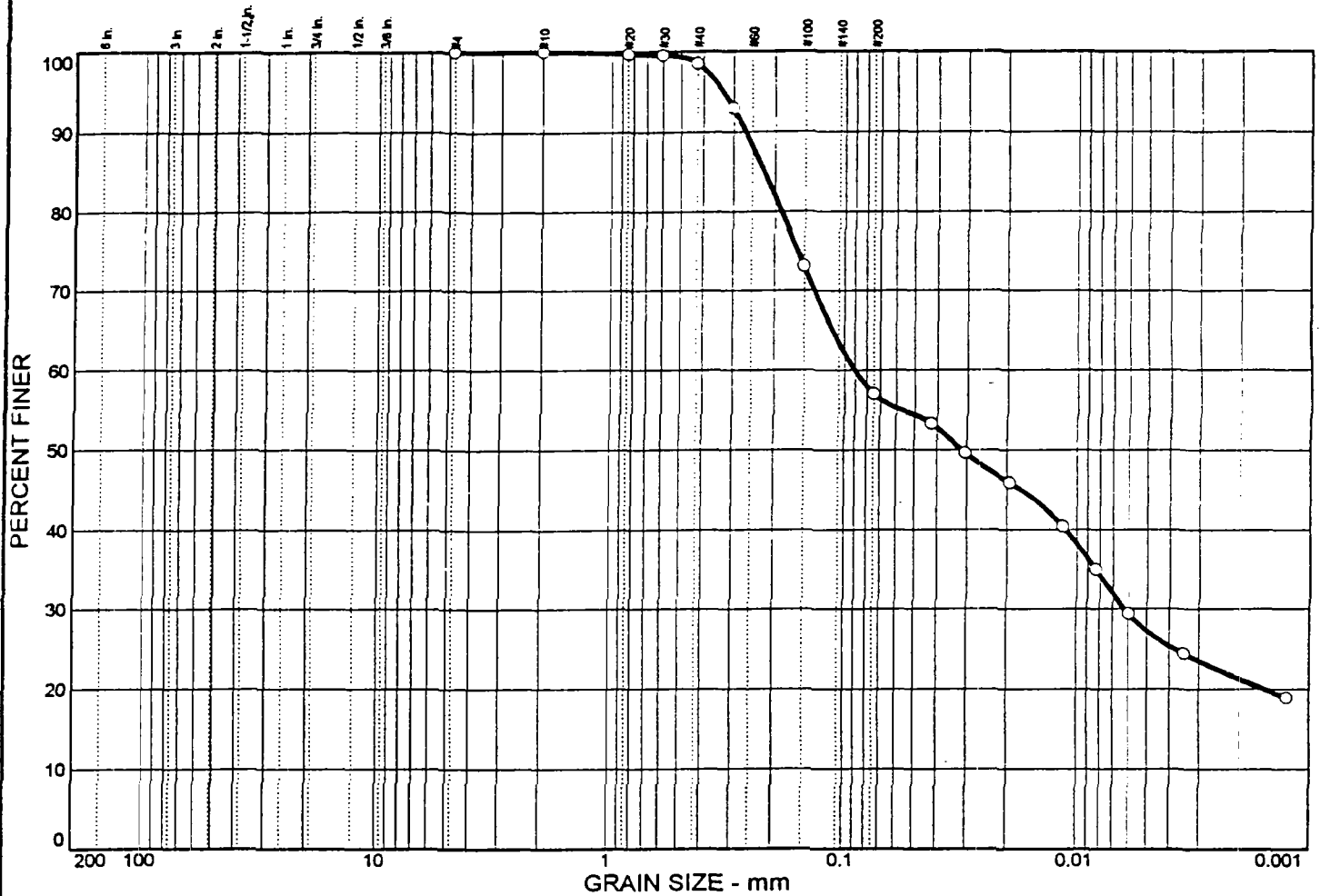
○TESTED BY: RM/MJG
CHECKED BY: JPL
NATURAL MOISTURE: 16.0%
SPECIFIC GRAVITY: 2.63

USCS Particle Size Distribution Report

HULL & ASSOCIATES, INC.

FIGURE NUMBER

USCS Particle Size Distribution Report



	% + 3"	% GRAVEL		% SAND			% FINES			
		CRS.	FINE	CRS.	MEDIUM	FINE	SILT		CLAY	
○	0.0	0.0	0.0	0.0	1.5	41.4	29.9		27.2	
×	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
○	26	15	0.222	0.0902	0.0315	0.0062				

MATERIAL DESCRIPTION						USCS	AASHTO
GREY/BROWN SANDY LEAN CLAY						CL	

Project No. PWM-001 Client: KERR-McGEE CHEMICAL, LLC Project: TOLEDO TIE TREATMENT SITE Location: 98-569 SB-3 CPT-39(CLAY) DEPTH: 4.0-8.0'	Remarks: ○ TESTED BY: RM/MJG/JPL CHECKED BY: MJG NATURAL MOISTURE: 21.3% SPECIFIC GRAVITY: 2.64
USCS Particle Size Distribution Report HULL & ASSOCIATES, INC.	
FIGURE NUMBER	

H.C. Nutting Company
4120 Airport Road
Cincinnati, Ohio 45226

6/12/98smo

Hull & Associates Inc.
Toledo Tie Treatment Site
Proj. PWM-001
HCN W.O. # 12106.010

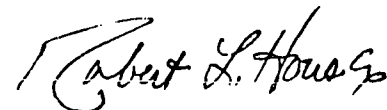
TABLE I

TABULATION OF CONSTANT HEAD-FIXED WALL PERMEABILITY TEST DATA
(Test performed per ASTM D-2434)

Lab No.	Boring No.	Sample No.	Depth (Ft.)	Dry Density (Lbs./Ft)	Total Head P.S.I.	Initial(I) Final(F) Natural W.C. %	(K) CM/Sec.	Material Description
4177	98-567	SB-1,BG-1	5-8	98.1	0.86	21.5(I) 21.5(F)	2.7x10-4	FINE SAND Remolded "Tight Condition"
4178	98-568	SB-3,CPT-39	4-8	106.0	5.87	16.3(I) 18.0(F)	2.4x10-6	SILTY SAND,TR ROOTS Remolded "Tight Condition"

prm6-12

H.C. NUTTING COMPANY



Robert L. House,
Vice President/Lab. Director

APPENDIX F

City of Toledo Comprehensive Ditch Plan

SDMS US EPA Region V

Imagery Insert Form

**Some images in this document may be illegible or unavailable in SDMS.
Please see reason(s) indicated below:**

☐

Illegible due to bad source documents. Image(s) in SDMS is equivalent to hard copy.

Specify Type of Document(s) / Comment

☐

Confidential Business Information (CBI).

This document contains highly sensitive information. Due to confidentiality, materials with such information are not available in SDMS. You may contact the EPA Superfund Records Manager if you wish to view this document.

Specify Type of Document(s) / Comment

☒

Unscannable Material: Oversized X or Format.

Due to certain scanning equipment capability limitations, the document page(s) is not available in SDMS. The original document is available for viewing at the Superfund Records center.

Specify Type of Document(s) / Comment

☐

Other:

APPENDIX G

City of Toledo POTW Discharge Standards

SDMS US EPA Region V

Imagery Insert Form

**Some images in this document may be illegible or unavailable in SDMS.
Please see reason(s) indicated below:**

☐

Illegible due to bad source documents. Image(s) in SDMS is equivalent to hard copy.

Specify Type of Document(s) / Comment

☐

Confidential Business Information (CBI).

This document contains highly sensitive information. Due to confidentiality, materials with such information are not available in SDMS. You may contact the EPA Superfund Records Manager if you wish to view this document.

Specify Type of Document(s) / Comment

☒

Unscannable Material: Oversized X or Format.

Due to certain scanning equipment capability limitations, the document page(s) is not available in SDMS. The original document is available for viewing at the Superfund Records center.

Specify Type of Document(s) / Comment

☐

Other:

June 1, 1998

MEMO

To: Kerry Bruce, Utility Rate Coordinator

Through: Donald M. Moline, Director Public Utilities
William J. Garber, Acting Manager TDOES

From: John D. Walthall, Industrial Waste Control Specialist

Re: Changes to TMC 930.05 © Toledo Standards

SUBSTANCE	NOT TO EXCEED (.mg/l)
Cadmium, total	0.3
Copper, total	1.0
Lead, total	1.5
Nickel, total	2.9
Zinc, total	6.3
Silver, total	0.2
Mercury, total	0.03
Chromium, hexavalent	0.8
Arsenic, total	0.6
Cyanide, total	1.1
Oil and Grease, Hydrocarbon (TPH)	100 mg/l (avg.)* 250 mg/l (grab sample)
TTO (Total Toxic Organics)	5.0
Benzene	0.05
BTEX	0.5
L.E.L.	10%
PCB's, total	0.007

*Or such other limits agreed to by the City pursuant to Section 930.08. (Unusual Discharges TPH not to exceed 15 mg/l.)

The Director of Public Utilities reserves the right to prohibit any discharge deemed to present potential for harm to health, the environment or the treatment plant. The Director of Public Utilities may also impose mass limitations for specific substances when he determines that the imposition of mass limitations is necessary either to protect the treatment works, sludge disposal processes, sludge disposal options, and receiving streams, or to comply with the City's NPDES permit. (Ord. 375-94. Passed 6-28-94.)

cc: Robert C. Stevenson, Acting Commissioner
Chris Middlebrough, Acting Admin. Operations, Water Reclamation
Reynold F. Gerson, Admin. Q.C./Compliance, Water Reclamation
E. Jeanette Ball, Chief Water Resources

CHAPTER 930

Sewer Discharge Control

930.01	Purpose and policy	930.12	Reporting requirements for industrial discharger.
930.02	Administration and enforcement.	930.13	Enforcement.
930.03	General prohibitions.	930.14	Monitoring facilities.
930.04	Prohibited discharges.	930.15	Inspection and sampling.
930.05	Limitations on wastewater strength.	930.16	Confidential information.
930.06	Modification of standards.	930.17	Records retention.
930.07	Limitations on dischargers.	930.18	Charges and fees.
930.08	Unusual waste.	930.19	Violation and enforcement costs incurred by the City.
930.09	Spill control.	930.20	Right to appeal.
930.10	Haulers of domestic septic tank sludge.		
930.11	Grease and sand separators.		

CROSS REFERENCES

Prohibited discharges - see S.U. & P.S. 927.01 et seq.
High strength surcharges - see S.U. & P.S. 929.08

930.01. Purpose and policy.

(a) This chapter sets forth uniform requirements for discharges into the City's treatment works, and enables the City to protect the public health.

(b) The objectives of this chapter are:

(1) To prevent the introduction of pollutants into the City's treatment works which will damage or interfere with the normal operation of the treatment works;

(2) To prevent the introduction of pollutants into the City's treatment works which do not receive adequate treatment and which will pass through the treatment works into receiving waters or the atmosphere or otherwise be incompatible with the treatment works;

(3) To prevent the introduction of pollutants into the City's treatment works which will interfere with sludge management options;

(4) To improve the opportunity to recycle and reclaim wastewater and sludge from the City's treatment works.

(c) This chapter provides for the regulation of discharges to the City's treatment works through the enforcement of the provisions of this chapter and rules, regulations and standards and binding agreements. The Director of Public Utilities shall be responsible for the administration and enforcement of provisions of this chapter. "Director", as used in this chapter, means the Director of Public Utilities.

(d) This chapter provides for the incorporation, by reference of the National Categorical Standards that are promulgated by U.S.E.P.A.

(e) This chapter provides for the incorporation, by reference, of any applicable statutes, ordinances or regulations of the State and any other political subdivisions which discharge into the treatment works, to the extent that those statutes, ordinances or regulations are more stringent than the City's.
(Ord. 883-85, Passed 12-31-85.)

930.02. Administration and enforcement.

No person shall discharge sewage, industrial waste or other waste to the treatment works without complying with the provisions of this chapter.

Areas outside of the jurisdiction of the City which discharge to the treatment works of the City shall execute agreements in accordance with Section 929.18 binding the governmental entity having jurisdiction over such areas to the provisions of this chapter. Such governmental entities shall enact appropriate

measures making the provisions of this chapter legally enforceable on the dischargers and their jurisdiction. The City shall have primary authority to enforce this chapter outside the City in accordance with Ohio R.C. 6111.032.

Fulfillment of the requirements of the foregoing paragraph shall be a prerequisite to the City's continuing to serve areas presently served or to serve additional areas outside the jurisdiction of the City.

(Ord. 883-85, Passed 12-31-85.)

930.03. General prohibitions.

(a) No person shall place, deposit or permit to be deposited in any unsanitary manner on public or private property within the City, industrial waste, sludges or hazardous waste, or any other objectionable waste.

(b) Except as provided in Section 927.02, no person shall construct or maintain any privy, privy vault, septic tank, cesspool, or other facility intended or used for disposal of wastewater in the City.

(c) No person shall discharge to any storm drains and water-courses within the City, any wastewater, or other prohibited or restricted materials covered by this chapter except where approved by the Director.

(Ord. 883-85, Passed 12-31-85.)

(d) No person shall access the sewer system or POTW for any activity including discharge of hauled septic or industrial wastes except at locations and times designated by the Director as permitted in Section 930.10. Any removal of manhole lids, or other access to the sewer system for the purpose of discharging wastes at times and/or locations other than those designated by the Director, or without the express written permission of the Director, shall be considered a violation and shall be subject to enforcement action including fines and penalties allowed under this section.

(Ord. 724-91, Passed 9-17-91.)

930.04. Prohibited discharges.

(a) No person shall discharge or cause to be discharged to any sanitary sewer any unpolluted water such as, but not limited to, storm water, ground water, roof water runoff, subsurface drainage, footer drain discharge, or nonresidential cooling or noncontact water. Such waters from limited areas, which may be polluted at times, may be discharged to a sanitary sewer by permission of the Director of Public Utilities.

In the event of violation of the aforesaid prohibition, the Director of Public Utilities shall issue a written order to the person discharging such unpolluted waters for the removal of unpolluted water connections to such sanitary sewer within

ninety days after the service of such order. A written order shall be served on such person by personal service or by certified or registered mail, return receipt requested.

Discharge of unpolluted waters, other than that exempted above, shall be discharged to such sewers specifically designed as combined sewers or storm sewers or to a natural outlet approved by the Director of Public Utilities and other governmental agencies. Unpolluted industrial cooling water or process water may be discharged on approval of the Director and other governmental agencies, to a storm sewer, combined sewer or natural outlet.

(b) No person shall cause to be discharged either directly or indirectly, any of the following described substances into the treatment works of the City:

(1) Any substance which alone or by interaction with other substances, creates an atmosphere within the City's treatment works which exceeds ten percent (10%) of the lower explosive limit (LEL) as designated by the National Fire Protection Association or which are injurious in any other way to the operation of the treatment works;
(Ord. 883-85, Passed 12-31-85.)

(2) Any substance that will solidify or become discernibly viscous such as grease, oil, nonbiodegradable cutting oil, products of mineral oil origin or any other viscous substances in quantities capable of obstructing the sewer's flow or interfering with the proper operation of any portion of the treatment works or passing through the treatment works;
(Ord. 724-91, Passed 9-17-91.)

(3) Any wastewater having a pH of less than 5.0 or greater than 12.0 or having any other corrosive properties capable of causing damage or hazard to structures, equipment, or personnel of the system;

(4) Any wastewater containing toxic pollutants in sufficient quantity, which alone or by interaction, injure or interfere with any wastewater treatment process or constitutes a hazard to humans or animals;

(5) Any noxious or malodorous substance, which either alone or by interaction creates a public nuisance or hazard to human life or prevents entry into the sewers for their maintenance and repair;

(6) Any substance which will cause the treatment works effluent, or treatment residues, sludges, or scums to be unsuitable for reclamation and reuse or which interferes with the reclamation process;

(7) Any substance which will cause the City to be in noncompliance with sludge disposal criteria, guidelines or regulations developed under Section 405 of the Act or any criteria, guidelines or regulations affecting sludge use or disposal developed under the Federal Solid Waste Disposal, the Clean Air, the Toxic Substance Control Acts, or State standards applicable to the sludge management method being used;

(8) Any substance in concentrations which will cause the City to violate its NPDES permit or which will inhibit the treatment process;

(9) Any substance with objectional color not removed in the treatment works such as, but not limited to, dye wastes and vegetable tanning solutions;

(10) Any wastewater having a temperature which interferes with the treatment works or interferes with the biological activity in the treatment works; specifically wastewater with a temperature exceeding 60 degrees Centigrade (140 degrees Fahrenheit) at its introduction to the public sewer or which causes influent

to the wastewater treatment plant to exceed 40 degrees Centigrade (104 degrees Fahrenheit);

(11) Any slug or slug load of any substance, including biochemical oxygen demanding pollutants, released in a single extraordinary discharge episode of such volume or strength as to cause interference to the treatment works;

(12) Any substance which alone or by interaction with other substances, emits chemical contaminants into the atmosphere or any confined areas of the treatment works in concentrations exceeding the threshold limit value (TLV) established for airborne contaminants, by the American Conference of Governmental Industrial Hygienists (ACGIH) or the Occupational Safety and Health Administration (OSHA);

(13) Any compatible waste in excess of the limits for normal domestic wastewater, except where permitted, subject to the provisions of Section 929.08.
(Ord. 883-85, Passed 12-31-85.)

(14) Any pollutants which create a fire or explosion hazard in the POTW, including, but not limited to, wastestreams with a closed cup flashpoint of less than 140 degrees Fahrenheit or 60 degrees Centigrade using the test method specified in 40 CFR 261.21.
(Ord. 724-91, Passed 9-17-91.)

930.05, Limitations on wastewater strength.

(a) National Categorical Pretreatment Standards.

All industrial dischargers shall comply with applicable categorical standards promulgated by the USEPA pursuant to the Act.

(b) State or other governmental requirements.

All dischargers shall comply with applicable State and other requirements legally adopted by other political subdivisions which discharge into the City's treatment works.
(Ord. 883-85, Passed 12-31-85.)

(c) Toledo standards.

All dischargers shall comply at all times with the following Not To Exceed concentrations as measured at a point prior to discharge to the public sewers. Not To Exceed concentrations shall be determined by obtaining a composite sample of the wastewater collected only during appropriate production periods over any continuous twenty-four hour period by either flow proportioned or time proportioned means. Grab samples may also be used where required or approved by the Director.

Substance	Not To Exceed
Cadmium, total	0.3
Copper, total	1.0
Lead, total	1.5
Nickel, total	2.9
Zinc, total	6.3
Silver, total	0.2
Mercury, total	0.03
Chromium, hexavalent	0.8
Arsenic, total	0.6
Cyanide, total	1.1
Oil and Grease, Hydrocarbon	100 mg/l (avg)* 250 mg/l (grab sample)

*Or such other limits agreed to by the City pursuant to Section 930.08.

The Director of Public Utilities may impose mass limitations for specific substances when he determines that the imposition of mass limitations is necessary either to protect the treatment works, sludge disposal processes, sludge disposal options, and receiving streams, or to comply with the City's NPDES permit.
(Ord. 375-94, Passed 6-28-94.)

(d) Dilution exclusion.

No industrial discharger shall increase the use of potable or process water in any way for the purpose of diluting a discharge or as a partial or complete substitute for adequate treatment to achieve compliance with the requirements of this chapter and the rules, regulations and standards promulgated by the Director.
(Ord. 883-85, Passed 12-31-85.)

930.06. Modification of standards.

(a) The City reserves the right to amend this chapter and the rules and regulations of the Director in order to assure compliance by the City with applicable Federal and State laws, regulations and the City's NPDES Permit.

(b) All categorical standards promulgated by the USEPA shall be included by reference as a part of the limitations defined in Section 930.05 upon their effective date.

(c) All State and other requirements legally adopted by political subdivisions which discharge to the City's treatment works shall be included, by reference, as part of the limitations defined in Section 930.05 upon their effective date.

(d) An application for modification of a categorical standard may be considered for submission to the Regional Administrator by the Director when all requirements of 40 CFR part 403.7 are met. Any data and information necessary for the application must be submitted to the City by the industrial discharger.

(e) Any changes to the Toledo standards contained in this chapter shall include a reasonable time scheduled for compliance. Such time schedule shall not exceed two years except under unusual circumstances and only after approval by the Director of Public Utilities. Compliance with categorical standards shall be the compliance date identified in the applicable regulation.
(Ord. 883-85, Passed 12-31-85.)

930.07. Limitations on dischargers.

(a) If any water or waste are discharged or proposed to be discharged to the treatment works, which violate the standards or promulgated rules or regulations, the Director of Public Utilities may:

- (1) Reject the waste;
- (2) Require acceptable pretreatment as a condition for discharge to the public sewers;
- (3) Require control over the quantities and rates of discharge;

(b) If the Director permits the pretreatment or equalization of discharges, the design and installation of the facilities for pretreatment or equalization shall be subject to review and approval of the Director of the Ohio Environmental Protection Agency (OEPA) and the Director of Public Utilities in accordance with Ohio R. C. Chapter 6111. The property owner or discharger shall not begin construction of facilities until approvals in writing have been obtained by both the Director and Director of the OEPA.
(Ord. 883-85, Passed 12-31-85.)

930.08. Unusual waste.

No provision of this chapter shall prevent an agreement between the City and the discharger whereby wastewater with unusual strength or character may be discharged to the treatment works, except that the discharge may be subject to additional charges and fees, which shall be set forth in the agreement, commencing with any increased cost of the City to provide the service required. No agreement entered into between the City and a discharger will violate the general and specific discharge limitations set forth in this chapter or any other Federal or State regula-

tions or standards including the National Categorical Pretreatment Standards.
(Ord. 883-85, Passed 12-31-85.)

930.09. Spill control.

(a) Each discharger shall provide safeguards against the accidental release to the treatment works of prohibited, or limited substances as set forth in this chapter and the rules and regulations of the Director. Additionally, safeguards shall be provided for the hazardous substances identified in Section 311 of the Clean Water Act. At a minimum each discharger who stores 1,000 gallons or more of liquid substances identified by this chapter and/or Section 311 of the Clean Water Act shall have on file a spill control plan prepared by a registered professional engineer. The discharger shall file a letter with the Director indicating that such a plan is in effect. Any facilities or procedures to prevent accidental releases shall be provided and maintained at the discharger's expense.

(b) Each discharger shall take reasonable and necessary steps to reduce or eliminate any adverse effects of an accidental discharge on the City's treatment works.

(c) In the case of an accidental release, it shall be the discharger's responsibility to report all accidents to the Director in accordance with the requirements set forth in Section 930.12(f).
(Ord. 883-85, Passed 12-31-85.)

930.10. Haulers of domestic septic tank sludge.

Haulers of domestic tank sludge and waste which require special handling or facilities shall comply with the rules and regulations of the Director of Public Utilities and shall pay to the City the amounts required for acceptance and treatment in the City's treatment works.

No person shall discharge domestic septic tank waste to the treatment works at any location other than the septic tank waste facilities provided by the City. Acceptance of domestic septic tank sludge and waste at these facilities shall be limited to sludges and waste originating within the City from private wastewater disposal facilities permitted by the provisions of Section 927.02, and from such facilities located outside the City for which there are in effect formal agreements, providing for acceptance of domestic tank sludges and waste originating from private wastewater disposal facilities within their areas.
(Ord. 883-85, Passed 12-31-85.)

930.11. Grease and sand separators.

Dischargers shall provide grease, oil and sand separators when they are necessary for the proper handling of liquid wastes containing excessive amounts of grease or any flammable waste, sand or other harmful substances; except that such separators shall not be required for premises used exclusively for residential purposes. Separators shall comply with the rules and regulations established by the Director of Public Utilities and shall be located for accessible inspection and cleaning.

Where grease, oil and sand separator facilities are provided or required, they shall be maintained continuously in safe, satisfactory and effective operational condition by the owner at his expense.
(Ord. 883-85, Passed 12-31-85.)

930.12. Reporting requirements for industrial dischargers.**(a) Baseline Monitoring Report.**

All industrial users discharging, or proposing to connect to the treatment works, shall complete and file with the Director of Public Utilities a Baseline Monitoring Report in the form provided by the Director.

Existing industrial users shall file a completed report as required by the Director within ninety days after notification. Existing industrial dischargers who propose to mod-

ify their processes and/or wastewater characteristics shall file a report at least ninety days before modification. Proposed new industrial dischargers shall file a report at least ninety days before connecting to the treatment works. The baseline monitoring form provided by the Director shall require the discharger to report the following:

(1) Name, address and location of the industrial discharger;

(2) Standard Industrial Classification (SIC) number according to the Standard Industrial Classification Manual, Federal Bureau of the Budget, 1972, as amended;

(3) Each product produced by type, amount, process or processes and rate of production;

(4) Type and amount, average and maximum per day, of raw materials utilized;

(5) Site plans, floor plans, mechanical and plumbing plans, and details to show all sewers, sewer connections, inspection manholes, sampling chambers and appurtenances by size, location and elevation;

(6) Description of activities, facilities and plant processes on the premises including all materials which are or may be discharged to the treatment works, and the quantity of materials containing prohibited or toxic substances stored or handled on the premises;

(7) Time and duration of discharges;

(8) Measurements, or verifiable estimates of average, daily and instantaneous peak wastewater flow rates, in gallons per day, including any daily, monthly and seasonal variations;

(9) Nature and concentration of any pollutants or substances in the discharge, as follows:
(Ord. 883-85. Passed 12-31-85.)

A. Existing industrial dischargers shall provide a disclosure of wastewater constituents and characteristics including, but not limited to, materials with specific limits defined in Section 930.05, and the listed or characteristic hazardous wastes for which the industrial user has submitted initial notification under 40 CFR 403.12(p).

B. Existing industrial dischargers who propose to modify their processes and/or wastewater characteristics or new industrial dischargers shall provide at least ninety days prior to actual discharge an estimate of their wastewater constituents and characteristics including, but not limited to, materials identified in Section 930.05, and the listed or characteristic hazardous wastes for which the industrial user has submitted initial notification under 40 CFR 403.12(p).
(Ord. 724-91. Passed 9-17-91.)

C. Existing industrial dischargers who propose to modify their processes and/or wastewater characteristics or new industrial dischargers shall provide a disclosure of wastewater constituents and characteristics as defined in subsection (a)(9)A. hereof, within ninety days after the discharge is introduced into the City's treatment works:

(10) Statement regarding whether compliance with this chapter is being achieved on a consistent basis, and, if not, whether additional operation and maintenance activities and/or additional pretreatment is required pursuant to Section 930.12 (b);

(11) Any other information or data concerning the industrial discharger's operations and/or wastewater that may affect the treatment works and/or the City's ability to meet its NPDES Permit;

(12) Signature of:

A. For a corporation, a principal executive officer or a duly authorized representative responsible for the overall

operation of the facility discharging to the treatment works.

B. For a partnership or proprietorship, a general partner or the proprietor;

C. When required by the Director a qualified engineer.

The Director shall evaluate the complete report and data furnished by the industrial discharger and may require additional information. After full evaluation and acceptance of the data furnished, the Director shall notify the discharger of his acceptance.

(b) Pretreatment compliance schedule.

Where additional pretreatment and/or operation and maintenance activities will be required to comply with this chapter, the industrial discharger shall submit a reasonable schedule by which the additional pretreatment and/or implementation of additional operation and maintenance activities will be provided. The schedule shall be subject to the approval of the Director but shall not exceed two years for Toledo standards except for unusual circumstances. Any compliance schedule related to a categorical standard shall not exceed the time limit provided in the regulation. The dischargers shall provide the following information:

(1) Milestone dates for the commencement and completion of major events leading to the construction and operation of additional pretreatment required for the discharger to comply with the requirements of this chapter, such as completing preliminary and final plans, executing contracts for major components, commencing and completing construction, and other acts necessary to achieve compliance with this chapter except that:

A. The Director shall not permit a time increment for any single milestone date to exceed nine months; and

B. The discharger shall submit no later than fourteen days following each milestone date in the schedule and the final date for compliance, a progress report to the Director, including a statement that they complied with the increment of progress represented by the milestone date and, if not, the date on which they expect to comply with the particular increment of progress, the reason for the failure to timely complete the increment progress, and the steps taken to return the construction to the approved schedule. In no event shall more than nine months elapse between such progress reports.

(2) When additional pretreatment and/or operation and maintenance activities are placed in operation, the industrial discharger shall disclose within ninety days of start-up the nature and concentrations of discharged substances limited or prohibited in this chapter together with the statement as provided in subsection (a)(10) hereof indicating whether compliance is being achieved on a consistent basis.

(3) When the Director accepts the discharger's compliance schedule for additional pretreatment or operation and maintenance, a violation of the compliance schedule is a violation of this ordinance.

(c) Categorical standards.

(1) Initial compliance report.

Within one hundred and eighty (180) days following the effective date of a categorical standard, any affected industrial discharger shall submit to the Director a Baseline Monitoring Report containing the information as described in subsection (a) hereof. If the discharger has previously submitted a report, then the report shall be amended to include the additional information required in subsection (a) (9) and (10) hereof.

(2) Compliance date report.

Within ninety days following the compliance date in a

categorical standard, all affected industrial dischargers shall submit to the Director a compliance statement as described in subsection (a) (10) hereof indicating whether the pretreatment standards and requirements are being met on a consistent basis. If an industrial discharger does not comply with applicable categorical standards and requirements, a compliance schedule shall be negotiated in accordance with subsection (b) hereof.

(3) Periodic compliance report.

Any industrial discharger subject to a categorical standard shall submit to the Director, periodic compliance reports during the month of June and December. The reports shall contain the results of the sampling analysis of the discharge which are required by the categorical standard and any other information necessary to determine compliance with categorical standards.

The Director may authorize the submission of periodic compliance reports in months other than those specified above.

(d) Toledo standards.

The Director may require industrial dischargers to monitor their dischargers and report the results to demonstrate compliance with Toledo standards defined in Section 930.05 (c). The Director shall notify the dischargers in writing of the reasons and detailed requirements for monitoring. If any discharger does not comply with the Director's request, the City may monitor the discharge and recover its costs, in accordance with Section 930.19.

(e) State and other governmental requirements.

Industrial dischargers shall meet all State or other requirements legally adopted by other political subdivisions which discharge into the City's treatment works.

(f) Reporting Accidental Releases and Operating Upsets.

(1) Upon an accidental release or operating upset resulting in a prohibited discharge and/or a discharge in excess of the limitations in Section 930.05 into the treatment works and/or any watercourse or storm sewer within the City's boundary, dischargers shall immediately notify the Director by telephone of the incident. The notification shall include the date, time, and location of the discharge, type of waste, concentration, and volume and the corrective actions taken.

(2) Within five working days following any such accidental discharge or operating upset, the discharger shall submit to the Director a detailed written report describing the following:

- A. Description of the discharge and its cause;
- B. Type of waste, concentration and volume;
- C. Duration of the discharge, including exact date and time, and if the discharge continues, the time when it will cease;
- D. All steps taken or to be taken to reduce, eliminate or prevent recurrence of the incident and to reduce or eliminate any adverse effect of the discharge on the City's treatment works.

(3) Dischargers shall permanently post emergency notification procedures on a bulletin board or other prominent place advising employees whom to call in the event of an accidental discharge or operating upset.

(4) A documented and verified bona-fide operating upset may be an affirmative defense to an enforcement action brought by the Director against an industrial discharger for any noncompliance which arises out of violation alleged to have occurred during the period of upset; however, it does not absolve the discharger from responsibility

and liability for any damage or injury to persons or property including the City's treatment works. It likewise does not absolve the discharger from liability for indemnification of the City for any penalties for violation of the City's NPDES Permit or for cleanup costs caused by the upset.

(g) Environmental control permits.

Industrial dischargers shall submit to the Director of Public Utilities a list of environmental control permits held by or for the facility.
(Ord. 883-85. Passed 12-31-85.)

(h) Additional Reporting Requirements.

If any industrial discharger subject to the reporting requirements in subsections (c)(3), (d), (e) hereof, monitors any pollutant more frequently than required by the Director using procedures specified in Section 930.15(b), the results of this monitoring shall be included with any compliance reports required by the Director.

In addition, if sampling performed by an industrial discharger indicates a violation, the discharger shall notify the Director within twenty-four hours of becoming aware of the violation. The discharger shall also repeat the sampling and analysis and submit the results to the Director within thirty days after becoming aware of the violation.
(Ord. 1122-89. Passed 11-28-89.)

(i) Changes in discharges, including hazardous wastes. All industrial users shall promptly notify the Director in advance of any substantial changes in the volume or character of pollutants in their discharge (including the listed or characteristic hazardous wastes for which the industrial user has submitted initial notification under 40 CFR 403.12(p)).
(Ord. 724-91. Passed 9-17-91.)

930.13. Enforcement.

(a) Emergency suspension of service.

(1) The City may for good cause shown suspend a discharger's wastewater treatment service when the Director of Public Utilities determines that an actual or threatened discharge presents or is likely to present an imminent or substantial danger to the health or welfare of persons; substantial danger to the environment, interference with the operation of the treatment works, or violation of any pretreatment limits imposed by this chapter and/or the rules, regulations and/or standards of the Director. Any discharger notified of the suspension of the City's wastewater treatment service shall, within a reasonable period of time as the Director may determine, cease all discharges to the City treatment works.

(2) Upon failure of the discharger to voluntarily comply with the suspension order within the specified time, the Director, in the name of the City, shall immediately begin judicial proceedings to compel the discharger's compliance with the suspension order.

(3) The City shall reinstate the wastewater treatment services and terminate additional proceedings to cease all discharges, upon the proof of the discharger of the elimination of the noncomplying discharge or conditions creating the threat of imminent or substantial danger as set forth above.

(4) The discharger's elimination of the noncomplying discharge shall not preclude the City from recovering costs incurred, as provided in Section 930.19, or enforcing penalties, as provided in Section 945.99.

(5) In the event a discharger's wastewater treatment service is suspended pursuant to subsection (a) (1) hereof, notification in writing shall be served upon such discharger within five days of such suspension by the Department of Public Utilities. Thereafter such discharger

shall have the right to respond, in writing, to notification served upon him within five calendar days of the date of the Department of Public Utilities notification. Such discharger shall also have the right to be heard on his suspension before the Director or his designated appointee regarding such suspension. In the event a hearing is requested by the discharger and conducted before the Director, the Director shall issue his findings and conclusions regarding the continuance of this suspension within ten calendar days of the hearing. Any appeal from the findings of the Director shall be in accordance with subsection (d) hereof.

(b) Termination of treatment services.

The City may seek to terminate the wastewater treatment services to:

(1) Any industrial discharger which fails to factually report its wastewater constituents and characteristics of its discharge;

(2) Any industrial discharger which fails to report significant changes in its wastewater constituents or characteristics;

(3) Any industrial discharger which refuses the Director reasonable access to its premises for the purpose of inspection or monitoring of discharges; or

(4) Any industrial discharger which violates the provisions of this chapter, the rules, regulations and/or standards of the Director, or any final judicial order entered with respect thereto.

(c) Notification of violation administrative adjustment.

(1) Whenever the Director finds that any discharger who has engaged in conduct which justifies termination of a wastewater treatment service, pursuant to subsection (b) hereof, the Director shall serve or cause to be served upon the discharger a written notice, either personally or by certified or registered mail, return receipt requested, stating the nature of the alleged violation.

(2) Within thirty days within the date of receipt of the notice, the discharger shall respond personally or in writing to the Director advising of its position with respect to the allegations. Thereafter, the parties shall meet to ascertain the accuracy, lawfulness and reasonableness of the Director's findings, and where necessary to establish an administrative adjustment plan for the satisfactory correction of the violation.

(d) Show cause hearing.

Where a violation is not corrected in a timely manner, the Director may order any discharger causing or allowing conduct prohibited by subsection (b) hereof to show cause before the Director why the proposed service termination action should not be taken. A written notice shall be served on the discharger by personal service or certified or registered mail, return receipt requested, specifying the time and place of a hearing to be held by the Director regarding the violation. The notice shall include the reasons why the enforcement action is to be taken, the proposed enforcement action, and shall direct the discharger to show cause before the Director why the proposed enforcement action should not be taken. The notice shall be served at least ten days before the hearing. Service may be on any statutory agent, officer or authorized representative of the discharger. The Director shall consider the proceedings at the hearing and shall then enter appropriate orders with respect to the alleged violation. The discharger may appeal to a court of competent jurisdiction in accordance with applicable laws.

(e) Judicial proceedings.

Following the Director's entry of any order regarding

the conduct of a discharger and notice to the discharger or such order by certified mail, return receipt requested, as to the provisions of subsection (b) hereof, the Law Director for the City may commence an action for appropriate legal and/or equitable relief in a court of competent jurisdiction. (Ord. 883-86. Passed 12-31-85.)

(f) Enforcement actions; annual publication.

At least annually, the City shall publish in the largest daily newspaper published in the City a list of all industrial users which at any time during the previous twelve months were in significant noncompliance with applicable pretreatment requirements. For the purposes of this provision, an industrial user is in significant noncompliance if its violations meet one or more of the following criteria:

(1) Chronic violations of wastewater discharge limits, defined here as those in which sixty-six percent (66%) or more of all of the measurements taken during a six-month period exceed (by any magnitude) the daily maximum limit or the average limit for the same pollutant parameter;

(2) Technical Review Criteria (TRC) violations, defined here as those in which thirty-three percent (33%) or more of all of the measurements for each pollutant parameter taken during a six-month period equal or exceed the product of the daily maximum limit or the average limits multiplied by the applicable TRC (TRC B 1.4 for BOD, TSS, fats, oil and grease, and 1.2 for all other pollutants except pH);

(3) Any other violation of a pretreatment effluent limit (daily maximum or longer term average) that the Director determines has caused, alone or in combination with other discharges, interference or pass through (including endangering the health of POTW personnel or the general public);

(4) Any discharge of a pollutant that has caused imminent endangerment of human health, welfare or to the environment or has resulted in the POTW's exercise of emergency authority to halt or prevent such a discharge;

(5) Failure to meet, within ninety days after the schedule date, a compliance schedule milestone contained in a wastewater discharge permit or enforcement order for starting construction, completing construction or attaining final compliance;

(6) Failure to provide, within thirty days after the due date, required reports such as baseline monitoring reports, ninety-day compliance reports, periodic self-monitoring reports and reports on compliance with compliance schedules;

(7) Failure to accurately report noncompliance;

(8) Any other violation or group of violations which the Director determines will or has adversely affected the operation or implementation of the City's pretreatment program. (Ord. 724-91. Passed 9-17-91.)

(g) Interpretations and rulings of the Director.

Any discharger or any interested party shall have the right to request in writing an interpretation or ruling by the Director on any matter covered within this chapter. The Director shall provide within thirty days his written interpretation or ruling detailing the basis and necessity of the interpretation or ruling and when same relates to a matter of performance or compliance with this chapter and/or the actions which must be taken to effect compliance. If the inquiry is by a discharger and deals with matters of performance or compliance with this chapter or the rules, regulations and standards of the Director and relates to an enforcement action, the receipt of a discharger's request shall stay all enforcement proceedings until the discharger receives the Director's written reply.

32K

Sewer Discharge Control

930.20

Any action taken by the Director may be appealed by the affected party to a court of competent jurisdiction in accordance with applicable laws.
(Ord. 883-85. Passed 12-31-85.)

930.14. Monitoring facilities.

All industrial dischargers which discharge industrial wastes or toxic pollutants shall when required by the Director of Public Utilities provide and operate at their own expense monitoring facilities at each discharge point to allow inspection, sampling, and flow measurement of each sewer discharge to the treatment works. These facilities shall be constructed in accordance with plans and specifications approved by the Director. Each monitoring facility shall be situated on the discharger's premises, except where such a location would be impractical or cause undue hardship to the discharger. The Director may concur with the facility being constructed in the public street or sidewalk area if the facility is located so that it will not be obstructed by landscaping or parked vehicles. There shall be ample room in and near such sampling facility to allow accurate sampling and preparation of sampling for analysis. The facility, sampling and measuring equipment, shall be maintained at all times in a safe and proper operating condition at the expense of the industrial discharger.

(Ord. 883-85. Passed 12-31-85.)

930.15. Inspection and sampling.

(a) The Director of Public Utilities may inspect the monitoring facilities of any industrial discharger to determine compliance with the requirements of the rules, regulations and standards of the Director. The discharger shall allow the Director or his representatives to enter upon the premises of the discharger at all reasonable hours, for inspecting, sampling or examining records. The Director shall have the right to cause to be set upon the discharger's property such devices as are necessary to conduct sampling, inspection, compliance monitoring and indoor metering operations and the costs shall be borne by the discharger.

(b) All analysis required under this chapter shall be performed in accordance with 40 CFR 136, as may be amended; except that where 40 CFR 136, does not include a sampling or analytical technique for the pollutant in question, sampling and analysis shall be performed in accordance with the procedures set forth in the USEPA publication "Sampling and Analysis Procedures for Screening of Industrial Effluents for Priority Pollutants," April, 1977, as may be amended, or in accordance with any other sampling or analytical procedures approved by the Administrator of the USEPA.

(Ord. 883-85. Passed 12-31-85.)

930.16. Confidential information.

Information and data furnished to the Director of Public Utilities with respect to the nature and frequency of discharge shall be available to the public or other governmental agencies without restriction unless the industrial discharger specifically requests and is able to demonstrate to the satisfaction of the Director that the release of the information would divulge information, processes or methods of production entitled to protection as trade

secrets or proprietary information of such discharges. When requested by an industrial discharger furnishing a report, the portions of a report which may disclose trade secrets or proprietary information shall be made available for public inspection, but shall not be made available upon written request to governmental agencies for uses relating to this chapter, the National Pollutant Discharge Elimination System (NPDES) Permit, State Disposal System Permit and/or the Pretreatment Program; except that, portions not publicly disclosed may be available for use by the State and/or State agency in judicial review or enforcement proceedings involving the discharger. Wastewater constituents and characteristics will not be recognized as confidential information.

Information accepted by the Director as confidential shall not be transmitted to any governmental agency or to the general public by the Director until and unless ten days' prior notification is given to the industrial discharger.

(Ord. 883-85. Passed 12-31-85.)

930.17. Records retention.

Industrial dischargers subject to this provision shall keep all written information relating to the monitoring, sampling and chemical analysis of its discharge for at least three years. All records pertaining to matters of administrative adjustment or any other enforcement or litigation activities brought by the Director of the City shall be kept by the industrial discharger until the enforcement activities have concluded and all the limitation periods have expired.

(Ord. 883-85. Passed 12-31-85.)

930.18. Charges and fees.

Industrial dischargers subject to this chapter shall pay the charges and fees set forth in rules and regulations authorized by this chapter in the manner provided by Sections 925.05 and 929.16.

(Ord. 883-85. Passed 12-31-85.)

930.19. Violation and enforcement costs incurred by the City.

(a) Any discharger violating any provision of this chapter shall be liable to the City for any expense, loss or damage caused by the violation. The City may bill the discharger for any cleaning, repair or replacement work caused by the violation.

(b) Any dischargers shall be liable for any fine or penalty incurred by the City caused by the discharger's violation of this chapter.

(c) Any discharger which must be monitored by the City for enforcement and/or compliance will be liable for the associated costs.

(Ord. 883-85. Passed 12-31-85.)

930.20. Right to appeal.

Industrial dischargers shall have the right to request in writing an interpretation or ruling by the Director of Public Utilities on any matter covered by this chapter, and shall be entitled to a written reply. Appeal of any action taken by the Director may be taken to a court of competent jurisdiction.

(Ord. 883-85. Passed 12-31-85.)

CHAPTER 931**Special Sewer Provisions and Payments**

931.01 Construction standards and specifications.
931.02 Approvals required.

931.03 Sewers constructed outside City limits.

CROSS REFERENCES

Sewer permit fees—see ADM. 127.05
 Sewer charges—see S.U. & P.S. Ch. 929

931.01. Construction standards and specifications.

All new, improved, expanded or replacement sanitary sewers and pumping facilities in the City which discharge to the treatment works of the City shall be constructed in accordance with rules, regulations, standards, specifications and conditions established by the Director of Public Service and, when applicable and required by law, by the Director of the Ohio Environmental Protection Agency. All construction, materials, appurtenances, sizes, slope, alignments and methods to be used in excavating, placing of pipe, joints testing and backfilling shall be in accordance with such standards and specifications. All materials and procedures shall comply with the contract specifications for the latest project performed by the City, or comply with the appropriate specifications of ASTM and/or WPCF/ASCE.

(Ord. 30-86. Passed 1-14-86.)

931.02. Approvals required.

Written approval of the Director of Public Service and, when applicable and required by law, of the Director of the Ohio Environmental Protection Agency, shall be obtained prior to the start of any construction of sewers and appurtenances thereto within the City, and the accomplishment

of such construction shall fully comply with the conditions of such approval.

(Ord. 30-86. Passed 1-14-86.)

931.03. Sewers constructed outside City limits.

Sanitary sewers and pumping facilities outside the City shall not connect to a treatment works that discharges to the treatment works of the City, or discharges directly to the treatment works of the City without the written authorization and approval of the Director of Public Utilities. The Director of Public Utilities shall not grant such authorization and approval for such connections unless:

(a) The sanitary sewers and pumping facilities are fully in accord with the rules, regulations and standards of the Director of Public Service for the City;

(b) Approval of the Director of the Ohio Environmental Protection Agency has been obtained and the conditions thereof fully complied with; and

(c) There exists a duly executed written agreement in accordance with the provisions of Section 929.18 which agreement shall provide for the acceptance of wastewater by the City from the area to be served by such connection.

(Ord. 30-86. Passed 1-14-86.)